United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328C

CONSERVATION STEWARDSHIP PROGRAM

Conservation crop rotation on recently converted CRP grass/legume cover

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Rotation minimizes disturbance (STIR less than 10) and reduces soil erosion below soil tolerance level. Enhancement not applicable on hayland.

Criteria

- Enhancement limited to acres where the conversion from Conservation Reserve Program (CRP) grass/legume conservation cover to annual cropland took place not more than 2 years prior to enrollment in Conservation Stewardship Program.
- This enhancement is not applicable on hayland.
- Crops shall be grown in a planned sequence as outlined in the implementation requirements.
- The crop rotation must include a minimum of three different crop types. For the purpose of this enhancement a cover crop is considered a different crop.
- Select crops, a tillage system, and cropping sequence(s) that will produce sufficient and timely quantities of biomass or crop residue which, in conjunction with other

practices in the management system that will reduce soil erosion from water and wind to a level below the soil tolerance (T) level (average annual soil loss).

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- Crop management must minimize soil disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 for the crop rotation (management STIR value).
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is planned for acres where the conversion from CRP grass/legume conservation cover to annual cropland took place no more than 2 years prior to enrollment in CSP. **Date of Conversion:** _____

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, verify the enhancement is not planned on hayland.
- ☐ Prior to implementation, use information provided from the participant to calculate soil loss estimates and STIR calculations using the current NRCS approved wind and water erosion prediction technologies. The planned rotation must meet the enhancement criteria of a management STIR value of less than 10 and average annual soil erosion from water and wind less than "T".

  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR value = _____

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to calculate soil loss estimates and STIR calculations. The applied rotation must meet the enhancement criteria above. **Soil erosion = _____t/ac/year and STIR value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328D

CONSERVATION STEWARDSHIP PROGRAM

Leave standing grain crops unharvested to benefit wildlife

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: ANIMALS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

Criteria

- Crops must be grown in a planned sequence as outlined in the plan. The crop rotation shall include a minimum of three different crops. For this purpose, a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.
- Select the crops and crop management activities that provide food, cover, and shelter for the targeted wildlife species using an approved habitat evaluation procedure.
- Leave a minimum ½ acre of unharvested, standing grain crops for each 40 acres of cropland. Unharvested plots shall be located in a single location on the 40 acre unit and additional plots shall be located on different 40 acres. *This enhancement is to be planned, contracted, and implemented on an entire field, not just the unharvested acres.*

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- Locate the unharvested plots adjacent to permanent cover such as brushy fence rows, field borders, forest land, or wetlands (this does not include newly established vegetation).
- Leave unharvested crops standing over winter until it is time to prepare the soil for planting the next crop.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, provide NRCS with the planned crop rotation.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

- ☐ Prior to implementation, develop a map showing planned location(s), crop type(s), and acreage of crops to be left unharvested.
- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or unharvested areas to verify the planned system meets the enhancement criteria.
- ☐ During implementation, take photos of all unharvested plots. Photos must indicate field location and date.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.
- ☐ After implementation, make a map showing implemented location(s), crop type(s), and acreage of crops that were left unharvested each year available for review by NRCS to verify implementation of the enhancement.
- ☐ After implementation, make photos of the unharvested plots available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.
- ☐ As needed, provide technical assistance in selecting crops for food, cover, and shelter according to the approved habitat evaluation procedure.
- ☐ As needed, provide additional assistance to the participant as requested.

- ☐ During implementation, evaluate planned crop changes, crop rotation, or unharvested areas to verify the planned system meets the enhancement criteria.
- ☐ After implementation, review the map(s) showing implemented location(s), crop type(s), and acreage of crops that were left unharvested each year, to verify implementation of the enhancement.
- ☐ After implementation, review photos of unharvested plots to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328F

CONSERVATION STEWARDSHIP PROGRAM

Modifications to improve soil health and increase soil organic matter

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Crops must be grown in a planned sequence as outlined in plan. The crop rotation must include a minimum of four different crops. For purposes of these criteria a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

CONSERVATION STEWARDSHIP PROGRAM

- Evaluation of the modified cropping system must produce a soil conditioning index (SCI) of zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. (management SCI value)

- Soil health assessment will be used to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion, as well as additional soil health objectives of the individual grower (primary assessment made in Year 1). During Year 3, a follow up assessment will be completed to allow time for changes to crop rotation and management activities to have an impact on soil health. No specific soil health assessment type is required or recommended by NRCS, but at a minimum the assessment must account for soil organic matter. The specific assessment selected should provide the grower information based on their soil health objectives.

- Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current/planned crop rotation and field operation(s) used for each crop.

Current/Planned Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Current/Planned Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

- ☐ Prior to implementation, select an assessment based on your soil health objectives.

Soil Health Assessment

Producer Objective	**Year 1 Assessment (Value)**	**Year 3 Assessment (Value)**
Soil Organic Matter (Required)		

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☐ During implementation, adjust crops, crop rotation, or field operations to improve the system after receiving the results of the soil health assessment. Complete in Year 1 and Year 3 at a minimum. Document adjustments below:

Adjusted Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Adjusted Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ Prior to implementation, verify the planned crop rotation includes at least four different crops.

☐ Prior to implementation, use information provided from the participant to calculate the management Soil Conditioning Index (SCI) value for each field using current NRCS wind and water erosion prediction technologies. Crop rotation must produce a positive trend in the Organic Matter (OM) subfactor value. **Management SCI Value = _____**
OM subfactor value = _____

- ☐ During implementation, evaluate planned adjustments in crops, crop rotation, or field operations to verify the new system meets the enhancement criteria.

- ☐ After implementation, evaluate the applied crop rotation or management using information provided from the participant to calculate SCI values to document that the applied rotation met the enhancement criteria.
  Management SCI Value = _____ OM subfactor value = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328G

CONSERVATION STEWARDSHIP PROGRAM

Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Conservation Practice 328: Conservation crop rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCMENT LIFE SPAN: 1 Year

Enhancement Description

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

Criteria

- This enhancement is limited to acres where the conversion of CRP grass/legume conservation cover to annual crops took place not more than 2 years prior to enrollment in CSP. This enhancement is not applicable on hayland.
- Crops must be grown in a planned sequence as outlined in plan. The crop rotation must include a minimum of four different crops. For purposes of these criteria a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

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- Grow crops that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index. (management SCI value)
- The crop rotation includes at least 2 years of high residue crops and/or cover crops per 3 years of the rotation. **(See STATE list of high residue crops)**
- For crop diversity, the planned crop sequence of at least 4 different crops should contain at least 3 different crop types; for example a mix of the following: warm season grass; warm season broadleaf; cool season grass; cool season broadleaf.
- Leave crop residue on the soil surface throughout the year.
- Keep a living root system established as much as practical for the given soil, cropping system, and climate area. Maximize root growth periods by planting the next crop or cover crop as soon as practical after the harvest and/or utilize perennial crops in the rotation. Aim to have living roots at least 90% of available growing days. **(See STATE provided guidance of options to maximize living root systems in local climate and cropping systems; determine available growing days and period of no growth, such as frozen periods in the north)**. Show before and after management files from current NRCS wind and water erosion prediction technologies to document benchmark and planned crop rotation to show increase in living root periods.
- Minimize all types of soil disturbance. No more than one crop-year in the rotation will have a Soil Tillage Intensity Rating (STIR) value greater than 20 and the rotation will have a positive trending SCI.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and planned field operation(s) used for each crop.

Current Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)	Crop Type (Warm Grass-WG, Cool Grass-CG, Warm Broadleaf-WB, Cool Broadleaf-CB)

Current Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management – Crop Rotation *(Crop rotation must include at least 4 different crops from 3 of the different crop types. The rotation must also include 2 years of high residue crops and/or cover crops per 3 years of the rotation. Use STATE list of high residue crops.)*

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)	Crop Type (Warm Grass-WG, Cool Grass-CG, Warm Broadleaf-WB, Cool Broadleaf-CB)

Planned Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, leave crop residue on the soil surface throughout the year.

☐ During implementation, take dated pictures with field indicated at least every 3 months to show residue or growing crops.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

☐ After implementation, provide for review pictures showing residue or growing crops throughout the year.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ Prior to implementation, verify the enhancement is planned for acres where the conversion from CRP grass/legume conservation cover to annual cropland took place no more than 2 years prior to enrollment in CSP. **Conversion Date:**_____

☐ Prior to implementation, verify the enhancement is not planned on hayland.

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- ☐ Prior to implementation, verify the crop rotation includes at least 2 years of high residue crops and/or cover crops per 3 years of the rotation. (Use STATE list of high residue crops)

- ☐ Prior to implementation, verify the planned crop rotation includes at least 4 different crops and contains at least 3 different crop types; for example a mix of the following: warm season grass; warm season broadleaf; cool season grass; cool season broadleaf.
  Planned number of crops: _____
  Planned number of crop types:_____

- ☐ Prior to implementation, use information provided from the participant to calculate the management Soil Conditioning Index (SCI) value for each field using current NRCS wind and water erosion prediction technologies. Crop rotation must produce a positive trend in the Organic Matter (OM) subfactor value.
  Management SCI Value = _____ **OM subfactor value = _____**

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to document that the applied rotation met the enhancement criteria.
  Applied number of crops: _____
  Applied number of crop types:_____

- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to calculate SCI value to document that the applied rotation met the enhancement criteria.
  Management SCI Value = _____ OM subfactor value = _____

- ☐ After implementation, review pictures showing residue or growing green crops throughout the year to verify the applied system meets the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328I

CONSERVATION STEWARDSHIP PROGRAM

Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

Criteria

- This enhancement is applicable on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **(Refer to state specific guidance of options to maximize nutrient uptake in local climate and cropping systems)**

- Forage species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with applicable local criteria and soil/site conditions. **(Refer to state specific lists of forage crops known to effectively utilize and scavenge nutrients)**

- Select forage crop (single species or mix of two or more species) and planting dates which will not compete with the other crop(s) yield or harvest. ***If legumes are part of the forage mix, consider that this may add nutrients to the system.***

- Select forage crop that is compatible with other components of the crop rotation and for its ability to efficiently scavenge and utilize excess soil nutrients, specifically nitrogen or phosphorous, whichever is identified as a potential risk to water quality. Nutrient uptake only occurs when a crop is actively growing. Therefore, it is imperative that the crops in rotation be planted as soon as possible after forage crop harvest (hay/balage/haylage/etc.) to maximize nutrient cycling and minimize offsite transport of nutrients.

- Determine method and timing of forage crop harvest to meet client objectives. Harvest the forage crop as late as practical to maximize plant biomass production and nutrient uptake.

- Ensure any herbicides used in the crop rotation are compatible with forage crop selections.

- Do not burn forage or residue.

- Do not graze forage crop.

- Reduce or maintain soil erosion from water and wind to below soil tolerance (T) level (average annual soil loss).

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and field operation(s) used for each crop.

Document excess nutrients identified in soil tests. *Soil tests should be taken as close to production crop harvest as possible.*

Field	Soil Test Date	Nutrient (Nitrogen or Phosphorus)	Soil Test Nutrient Result (ppm or lbs/ac)

Current Management Rotation

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Current Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management Rotation including Forage Crop

Field	Planned Crops/Forage Crop (in sequence)	Planting Date	Harvest Date

Planned Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Forage Crop and Seeding Rate *(forage crop may be single species or mix of two or more species)*

Species	Variety	Seed Size	Typical Seeding Depth	Seeding Rate (PLS lbs/acre)	Percent of Mix (%)

Forage Crop Establishment and Management Considerations:

- ☐ Establish forage crop mix as soon as practical prior to or after harvest of the production crop.
- ☐ During implementation, forage crop must not be grazed or burned.
- ☐ During implementation, notify NRCS of any planned changes in forage crop mix or crop rotation, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, update the tables above to document the applied crop rotation for the contract period and provide to NRCS.

After implementation, complete the table below and provide to NRCS

Task	Provide information and details
Seedbed Preparation	
Seeding Date	
Seeding Depth	
Seeding Method	
Fertilizer, as needed	
Weed Management, as needed	
Harvest Date (window)	
Harvest Method	

NRCS will:

☐ As needed, provide technical assistance in selecting forage crop for the crop rotation or substitute species that would meet the criteria of the enhancement. Forage crop may consist of a single species or mix of two or more species.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is being planned on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **<REFER TO STATE SPECIFIC GUIDANCE>**

☐ Prior to implementation, use information provided from the participant to calculate the average annual soil erosion value (water and wind) for each field using NRCS erosion prediction technologies.

Benchmark Management Soil Loss = _____ tons/acre/year

Planned Management Soil Loss = _____ tons/acre/year

☐ During implementation, evaluate any planned changes in forage crop selected, timing in crop rotation, management, or field operations to verify the new system meets the enhancement criteria.

☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to calculate average annual erosion value to document that the applied rotation meets the enhancement criteria.

Applied Management Soil Loss = _____ tons/acre/year

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E328L

CONSERVATION STEWARDSHIP PROGRAM

Leaving tall crop residue for wildlife

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (annual and mixed)

RESOURCE CONCERN ADDRESSED: Animals

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

Criteria

- The entire crop field must be harvested with residual stubble height minimum of 14 inches on average throughout the field. Only acres with this minimum stubble height are eligible for payment.
- Stubble must remain undisturbed until the State designated date in the following year to provide cover throughout winter months
- Planting and management of cover crops is not prohibited if it does not compromise the height and structure of the stubble cover
- States will supply a list of eligible crops and specify the dates that stubble must remain undisturbed for this enhancement.
- When possible, reduce or eliminate the use of herbicide treatments on weedy growth between the rows to provide additional cover and food sources for wildlife.

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Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, develop a map showing planned location(s), crop type(s) and acreage of crops to leave tall standing stubble.

☐ After implementation, provide photo documentation of stubble height left standing.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant.

☐ After implementation, verify stubble height and ensure stubble is left standing after winter months.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E328M

Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Conservation Practice 328: Conservation Cropping System

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Diversify existing crop rotation by adding pollinator friendly canola or sunflower crops into the rotation. The crop rotation shall include a minimum of three different crops. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides compliant with grower industry best management practice is allowed only during pre-bloom and bloom of canola or sunflower.

Criteria

- Crops will be grown in a planned sequence and shall include a minimum of three different crops.
- The crop rotation must include at least one year of canola or sunflower. Other pollinator friendly crops may be included. For these criteria, a pollinator friendly cover crop is considered a different crop. A pollinator friendly crop is defined as a crop, planted for harvest or as a cover crop, which provides nectar for pollinators and other beneficial insects. Examples of pollinator friendly crops are canola, sunflowers, clovers, and borage. To meet the purpose and definition of a pollinator friendly crop, these "flowering" crops must be allowed to bloom prior to harvest or termination. **<REFER TO STATE SPECIFIC LIST OF POLLINATOR FRIENDLY CROPS>**

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- Each year the enhancement is planned, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Plan/contract the actual acres planted to the pollinator friendly crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.
- Foliar systemic insecticides may not be applied to the pollinator friendly crop.
- Insecticides and fungicides applied during crop pre-bloom and bloom period of the canola or sunflower crop must be mitigated through integrated pest management and must follow industry best management practices.
    - Apply pesticides only when economic thresholds are met.
    - Apply pesticides at night or within two hours of sunset as this is when bees are least active.
    - Follow best practices for minimizing drift:
        - Use a low-drift nozzle, calibrate spray equipment, and use medium-to-coarse droplet size if possible.
        - Install cones or shrouds on field sprayers to reduce off- field movement.
        - When spraying fields, consider spot spraying or only applying pesticides to infested areas.
    - Select crop pest products with a residual activity of less than 8 hours.
    - Improve foraging areas for bees and other pollinators. Where possible, include flowering plants in non-crop areas. Avoid pesticide drift onto non-crop areas that include floral resources. Leave areas that include these resources intact whenever possible.

References

National Sunflower Association of Canada. Sunflower Production Guide. http://www.canadasunflower.com/production/sunflower-production-guide/

U. S. Canola Association. 2019. Best management Practices (BMPS) for Pollinator Protection in Canola Fields. https://www.uscanola.com/wp-content/uploads/2019/07/HBHC_Canola_030119.pdf

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation for all cropland acres on the operation. **<REFER TO STATE SPECIFIC LIST OF POLLINATOR FRIENDLY CROPS>**
- ☐ Prior to implementation, as needed, NRCS can provide technical assistance in selecting pollinator crops for the crop rotation or substitute species that would meet the criteria of the enhancement.
- ☐ Prior to implementation, provide maps for review by NRCS of the planned crop rotation, including areas which will include the pollinator friendly crops. Each year the enhancement is planned, at least 5% of the cropland acres on the operation must be planted to a pollinator friendly crop.

Current Management Rotation (complete table for each rotation)

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Planned Management Rotation including Pollinator Friendly Crops (complete table for each rotation)

Field	Planned Crops (in sequence)	Planting Date	Harvest Date	Acres in rotation

☐ During implementation, maintain records of any pesticide applications to canola, sunflower or pollinator friendly crops, including timing, material/product, application rate, and crop stage.

Field	Crop	Insecticide Applied	Application Date	Application Rate	Crop Stage

☐ During implementation, notify NRCS of any planned changes in crop rotation, pesticide applications, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS for review.

☐ After implementation, provide insecticide application records to NRCS for review to verify implementation meets the enhancement criteria.

NRCS will:

☐ As needed, provide technical assistance in selecting pollinator crops for the crop rotation or substitute species that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the crop rotation meets the criteria of the enhancement. *Plan/ contract the actual acres planted to canola or sunflower.*

☐ During implementation, evaluate any planned changes in crop rotation, pesticide applications, or management to verify the new system meets the enhancement criteria.

- ☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to verify the applied rotation meets the enhancement criteria.
- ☐ After implementation, review pesticide application records to verify implementation meets the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number_____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328N

Intercropping to improve soil health

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN ADDRESSED: Soil Quality Limitations

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

This enhancement involves the use of intercropping principles (i.e., growing two or more crops in close proximity to each other during part or all of their life cycles) to promote interactions that improve soil health, plant health, reduce inputs via increased biodiversity and contribute to pest management. Incorporating intercropping principles into an agricultural operation increases diversity and interaction between plants, arthropods, mammals, birds and microorganisms resulting in a more stable crop-ecosystem and a more efficient use of space, water, sunlight and nutrients. Furthermore, soil health is benefited by increasing ground coverage with living vegetation which reduces erosion and by increasing the quantity and diversity of root exudates which enhances soil fauna. This collaborative type of crop management mimics nature and is subject to fewer pest outbreaks, improved nutrient cycling and crop nutrient uptake, and increased water infiltration and moisture retention. **This enhancement cannot be used for annual hay or silage crops. It is for grain/seed/vegetable production only.**

Criteria

One or more of the following intercropping systems shall be used. Systems can be mixed during the contract period allowing for within year diversity on the same field. Producers should consult with the UDSA-Risk Management Agency (RMA) to clarify and understand how the use of any of the criteria options below might impact insurability of any cash crop grown using these methods.

- Plant two or more crops simultaneously in the same field. For example, planting chickpeas and flax together either in alternate rows or mixed within rows. Another example could be planting vegetables that perform well together, e.g. the "three sisters" intercropping system of corn, beans and squash.

- Relay intercropping – grow two or more crops on the same field with the planting of the second crop before the first crop is harvested. This cropping strategy enables production of a second crop in areas where time for seeding the second crop is considered inadequate for double cropping. For example, seeding soybeans into wheat that is still growing.

- Strip intercropping – grow crops in alternate strips wide enough to permit separate crop production machinery, but close enough for crops to interact (e.g., planting alternating strips of corn and soybeans 6 rows each or alternating strips of corn and Sudan grass). Generally, the maximum width of individual strips for effective interaction of crop pests and their natural enemies is about 30 ft. Note: this criterion is not the same as NRCS Conservation Practice Stripcropping Code 585

Documentation and Implementation Requirements

Participant will:

- Prior to implementation, provide NRCS with the current and planned crop rotation, including intercropping system used, for all cropland acres on the operation.
- Prior to implementation, provide maps for review by NRCS of the planned crop rotation.
- During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- During implementation, take dated pictures with field indicated at least every 3 months to show growing intercrops.
- After implementation, provide for review pictures showing growing intercrops throughout the year.

Current Management Rotation (complete table for each rotation)

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Planned Management Rotation With Intercropping (complete table for each rotation)

Field	Planned Crops (in sequence)	Planting Date	Harvest Date

NRCS will:

- As needed, provide technical assistance in selecting intercropping systems for the crop rotation that would meet the criteria of the enhancement.
- As needed, provide additional assistance to the participant as requested.
- Prior to implementation, verify the crop rotation meets the criteria of the enhancement. ***Plan/contract the actual acres planted to the intercrops.***
- During implementation, evaluate any planned changes in crops, crop rotation, or management to verify the new system meets the enhancement criteria.
- After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to verify the applied rotation meets the enhancement criteria.
- After implementation, review photos of the intercropping system.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329A

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce soil erosion

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish no till system to reduce sheet and rill and wind erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation (average annual soil loss).
- No full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The Soil Tillage Intensity Rating value must include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow

periods). Each crop must have a Soil Tillage Intensity Rating value of no greater than 10.

CONSERVATION STEWARDSHIP PROGRAM

- Use the current approved water and wind erosion prediction technology to determine the:
    - amount of randomly distributed surface residue needed;
    - time of year the residue needs to be present in the field, and
    - amount of surface soil disturbance allowed to reduce erosion to the desired level.
- Calculations must account for the effects of other practices in the management system.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, use information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a soil loss at or

CONSERVATION STEWARDSHIP PROGRAM

below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 10 for each crop in the planned rotation.

"T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____

☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329B

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce tillage induced particulate matter

Conservation Practice 329: Residue and Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Air

PRACTICE LIFE SPAN: 1 Year

Enhancement Description

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Field(s) must have an average annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination

of the current cash crop (includes fallow periods). Each crop must have a STIR value of no greater than 10.

- Use the current approved water and/or wind erosion prediction technology to determine the:
    - amount of randomly distributed surface residue needed;
    - time of year the residue needs to be present in the field, and
    - amount of surface soil disturbance allowed to reduce erosion to the desired level.
- Calculations shall account for the effects of other practices in the management system.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue shall be burned.

☐ During implementation, all residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify that the field to be establish in no-till has a soil loss at or below the soil tolerance (T) level for water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E329C

CONSERVATION STEWARDSHIP PROGRAM

No till to increase plant-available moisture

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value shall be no greater than 20.

CONSERVATION STEWARDSHIP PROGRAM

- Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ During implementation, maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and estimated surface residue cover using the NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a Soil Tillage Intensity Rating value of no greater than 20 for each crop in the planned rotation, and the estimated surface residue cover.
  STIR values for each crop in the rotation = _____

  Estimated surface residue cover for each crop in the rotation = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to the Soil Tillage Intensity Rating value, and estimated surface residue cover to document that the applied rotation met the enhancement criteria.
  STIR values for each crop in the rotation = _____

  Estimated surface residue cover for each crop in the rotation = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329D

CONSERVATION STEWARDSHIP PROGRAM

No till system to increase soil health and soil organic matter content

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Criteria

- All residues must be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Residue must not be burned, grazed, or harvested.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value shall be no greater than 20.

CONSERVATION STEWARDSHIP PROGRAM

- Evaluation of the cropping system (management) using the current approved soil conditioning index (SCI) procedure results in zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned, grazed, or harvested.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating (STIR) values using NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a Soil Tillage Intensity Rating value of no greater than 20 for each crop in the planned rotation.
  STIR values for each crop = _____
- ☐ Prior to implementation, use information provided from the participant and the approved soil conditioning index (SCI) procedure to verify the SCI is zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. **SCI value = _____ and OM subfactor value = _____**
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  STIR values for each crop = _____
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil conditioning index (SCI) and Organic Matter (OM) subfactor values to document that the applied rotation met the enhancement criteria. **SCI value = _____ and OM subfactor value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329E

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce energy

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Criteria

- Residue shall not be burned.
- All residues must be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The Soil Tillage Intensity Rating (STIR) value must include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). Each crop must have a STIR value no greater than 20.

- Reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system. Use the current NRCS wind and water erosion prediction technologies for determining energy use to document energy use reductions.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the current (benchmark) and planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Current (Benchmark) Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Current (Benchmark) Field Operation	Timing of Field Operation (month/year)

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Planned Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- ☐ During implementation, reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use the information provided from the participant to calculate the Soil Tillage Intensity Rating values and energy consumption for both the current system and the planned system using the approved NRCS wind and water erosion prediction technologies. Verify the Soil Tillage Intensity Rating value is no greater than 20 for each crop in the planned rotation and total energy consumption is reduced by at least 25%.

  Current STIR values = _____ and Energy Consumption = _____

  Planned STIR values = _____ and Energy Consumption = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if changes were made to the planned crop(s), crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and total energy consumption to document that the applied rotation met the enhancement criteria.

  Applied STIR values = _____ and Energy Consumption = _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E334A

CONSERVATION STEWARDSHIP PROGRAM

Controlled traffic farming to reduce compaction

Conservation Practice 334: Controlled Traffic Farming

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 5 Year

Enhancement Description

Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Criteria

- Ensure that controlled traffic lanes are designed and used in a manner that avoids concentrated flow that may result in gully erosion.
- Limit wheel/track traffic to no more than 25 percent of the soil surface. The same tracks must be used for all high load traffic continually. High wheel load traffic is defined here as any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.
- For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks.
- If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

- Use a Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic when the designated traffic lanes are obscured.
- Once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, develop a plan to limit wheel/track traffic to no more than 25 percent of the soil surface.
- ☐ Prior to implementation, complete the following table to provide the current and any planned changes to crop row width.

Crops in Rotation (shown in sequence)	Current Crop Row Width	Planned Crop Row Width

- ☐ Prior to implementation, complete the following table to provide the current equipment width and spacing used for the above crop rotation.

Equipment Used in Crop Rotation	Width of Equipment (feet)	Tire/Track Spacing (on-center Inches)

- ☐ Prior to implementation, complete the following table to provide any **planned changes** to equipment width and spacing used for the above crop rotation.

Equipment used in Crop Rotation	Width of equipment (feet)	Tire/Track spacing (on-center Inches)

Equipment used in Crop Rotation	Width of equipment (feet)	Tire/Track spacing (on-center Inches)

- ☐ During implementation, the same tracks must be used for all high load traffic continually. High wheel load traffic is any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.
- ☐ During implementation, use a Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic when the designated traffic lanes are obscured.
- ☐ During implementation, once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**
- ☐ During implementation, if ruts develop, use tillage or other specialized equipment to remove ruts and reestablish controlled traffic lanes.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the developed plan will limit wheel/track traffic to no more than 25 percent of the soil surface. **Percent wheel/track traffic = _____**
- ☐ Prior to implementation, ensure that controlled traffic lanes are planned and implemented in a manner that avoids concentrated flow that may result in gully erosion.
- ☐ After implementation, verify the plan was implemented to limit wheel/track traffic to no more than 25 percent of the soil surface. **Percent wheel/track traffic = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____
Fiscal Year Completed _____

CONSERVATION STEWARDSHIP PROGRAM

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345A

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce soil erosion

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value ratings shall be no greater than 40, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Use the current approved soil erosion prediction technology for water and wind erosion to determine the:

- Amount of randomly distributed surface residue needed.
- Time of year the residue needs to be present in the field.
- Amount of surface soil disturbance allowed to reduce erosion to the desired level of average annual soil loss.
- Calculations must account for the effects of other practices in the management system.

- In ridge-till systems, plan ridge height and ridge orientation to manage runoff and minimize erosion, with a maximum row grade of 4%.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use the information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 40 for each crop in the planned rotation.

  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345B

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce tillage induced particulate matter

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 40, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Reduce or modify tillage operations that create dust, especially during critical air quality periods.

- Adopt tillage practices that reduce particulate emissions.

CONSERVATION STEWARDSHIP PROGRAM

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

CONSERVATION STEWARDSHIP PROGRAM

☐ Prior to implementation, verify that the field to be establish in no-till has a soil loss at or below the soil tolerance (T) level for water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation.

"T"= _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____

☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345C

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to increase plant-available moisture

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- Field must have an annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- The Soil Tillage Intensity Rating (STIR) value MUST include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.

- Maintain a minimum 60 percent surface residue cover throughout the year.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ During implementation, maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

- ☐ Prior to implementation, use information provided from the participant to calculate the soil loss, Soil Tillage Intensity Rating values, and estimated surface residue cover using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have an annual soil loss at or below the soil tolerance (T) level, a Soil Tillage Intensity Rating value of no greater than 80 for each crop in the planned rotation, and the estimated surface residue cover.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year
  STIR values for each crop in the rotation = _____
  Estimated surface residue cover for each crop in the rotation = _____

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information the provided from the participant to calculate soil loss, Soil Tillage Intensity Rating values, and estimated surface residue cover to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year
  STIR values for each crop in the rotation = _____
  Estimated surface residue cover for each crop in the rotation = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345D

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to increase soil health and soil organic matter content

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn residues.
- Field must have an annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop

STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.

- Evaluation of the cropping system using the current approved soil conditioning index (SCI) procedure results in zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation (management SCI value).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, use information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have an annual soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 80 for each crop in the planned rotation.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ Prior to implementation, use information provided from the participant and the approved soil conditioning index (SCI) procedure to verify the SCI is zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. **SCI value = _____ and OM subfactor value = _____**
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil conditioning index (SCI) and Organic Matter (OM) subfactor values to document that the applied rotation met the enhancement criteria. **SCI value = _____ and OM subfactor value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345E

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce energy use

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Reduce the total energy consumption associated with field operations by at least 25% compared to the benchmark condition. The current NRCS wind and water erosion

prediction technologies must be used for determining energy use to document energy use reductions.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current (benchmark) and planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Current (Benchmark) Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Current (Benchmark) Field Operation	Timing of Field Operation (month/year)

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Planned Field Operation	Timing of Field Operation (month/year)

- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.
- ☐ During implementation, reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and energy consumption for both the current system and the planned system using the approved NRCS wind and water erosion prediction technologies. Verify the Soil Tillage Intensity Rating value is no greater than 80 for each crop in the planned rotation and total energy consumption is reduced by at least 25%.
  Current STIR values = _____ and Energy Consumption = _____
  Planned STIR values = _____ and Energy Consumption = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if changes were made to the planned crops, crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and total energy consumption to document that the applied rotation met the enhancement criteria.
  Applied STIR values = _____ and Energy Consumption = _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E381A

Silvopasture to improve wildlife habitat

Conservation Practice 381: Silvopasture Establishment

APPLICABLE LAND USE: Pasture; Forest; Associated Agricultural Land

RESOURCE CONCERN: Plants; Animals

ENHANCEMENT LIFE SPAN: 15 years

Enhancement Description

Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

Criteria

- Tree species and forage species must be adapted to the site and compatible with the planned management of the site.
- No plants on the federal or state noxious weeds list shall be planted.
- Where trees will be added to existing pasture, site preparation should be based on existing vegetation and soil conditions. Trees will be planted at an appropriate density to allow acceptable forage production and wood products.
- If pesticides are used, label recommendations must be followed.
- Only viable, high quality and adapted planting stock or seed will be used.
- Plant nutrients and/or soil amendments for establishment purposes will be applied according to a current soil test. Legume seed will be pre-inoculated or inoculated with the proper viable strain of Rhizobia immediately before planting.

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- Establish forage species and understory shrubs that will provide forage, browse, seed, cover, or nesting habitat for the wildlife species of concern. For additional guidance refer to NRCS Conservation Practice Standards Upland Wildlife Habitat Management (Code 645).
- Favor herbaceous seed mixes that include a diverse mix of native forbs and/or legumes to benefit wildlife including pollinators. Select species that vary in attributes such as timing of flowering, and production of leaves and fruit.
- Plantings will be protected from grazing until an adequate stand is established and meets the species specific, local standard for beginning grazing.

CONSERVATION STEWARDSHIP PROGRAM

Documentation Implementation Requirements

Participant will:

☐ Prior to implementation, select a tree or shrub species for establishment.

Tree or Shrub species	
Trees per acre	
Percent canopy cover	

☐ Prior to implementation, develop a grazing plan to keep grazing periods sufficiently short to allow for plants to recover before re-grazing occurs.

☐ During implementation, keep the following documentation:

- Records and photographs of planting preparation and any materials purchased or materials on hand used for the implementation of the enhancement.
- Documentation of seed (Pure Live Seed) and any fertilizer or soil amendments used for the implementation of the enhancement.

☐ After implementation, make documentation and photographs of livestock turn in/turn out grazing records for each field available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, make the forage planting/or tree planting and grazing records available for review by NRCS to verify implementation of the enhancement.

☐ The State approved NRCS Wildlife Habitat Evaluation Guide (WHEG) as completed and certified by an NRCS or partner wildlife biologist. Wildlife species of concern for the silvopastoral area will be specified on the WHEG. Total WHEG score after installation will equal 0.60 or greater.

NRCS will:

☐ Prior to implementation, complete the State approved NRCS Wildlife Habitat Evaluation Guide (WHEG) as completed and certified by an NRCS or partner wildlife biologist when applicable. Specific pollinator species targeted will be notated on the WHEG, and total

CONSERVATION STEWARDSHIP PROGRAM

score after implementation will equal 0.60 or greater.
WHEG score after implementation = _____

☐ Prior to implementation, verify a grazing plan was developed to keep grazing periods sufficiently short to allow for forages to recover before re-grazing occurs.

☐ Prior to implementation and as needed, NRCS will provide technical assistance:

- Planning site preparation and establishment specifications meeting NRCS Conservation Practice Standard Forage and Biomass Planting (Code 512) or Tree/Shrub Site Preparation (Code 490) and Tree/Shrub Establishment (Code 612).
- Prepare specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- Develop a grazing plan to keep grazing periods sufficiently short to allow for forages to recover before re-grazing occurs.

☐ During implementation, evaluate any planned changes to verify they meets the enhancement criteria.

☐ After implementation, verify the planned perennial planting was established to specifications developed for the site.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

CONSERVATION ENHANCEMENT ACTIVITY

E383A

CONSERVATION STEWARDSHIP PROGRAM

Grazing-maintained fuel break to reduce the risk of fire

Conservation Practice 383: Fuel break

APPLICABLE LAND USE: Forest and Range

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Fuel Break (Code 383) as listed below, and additional criteria as required by the NRCS State Office.

- A fuel break has been constructed around the property or around the targeted site to minimize the risk of damaging wildfires and to enhance the ability to conduct prescribed burning.
- Fuel breaks will be planted with desirable warm-season perennial vegetation as prescribed by local grazing land specialists. Over-seeding with desirable cool season annual forages will take place in the fall.
- The vegetation on the fuel break will be managed using a prescribed grazing plan. Animal stocking levels and rotation periods are designed to manage vegetation and avoid harm to sensitive plants.
- Manage grasses and forbs to minimize fine fuels.

- If trees or shrubs are not sufficiently controlled through grazing management, single-tree treatment with saws or chemicals will be applied.
- If herbicides are used, refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, determine and document the existing fuel breaks on the enrolled acres. Provide as much detail as possible such as length, average width, existing vegetation and past management activities. (NRCS will provide technical assistance, as needed)
- ☐ Prior to implementation, determine and document those sites capable of integrating into a grazing management plan with the establishment of desirable warm-season perennial vegetation and cool season annual forages. (NRCS will provide technical assistance, as needed)
- ☐ Prior to implementation, develop or update a prescribed grazing plan to guide the establishment of forages, animal stocking levels and rotation periods. Provide to NRCS field office. (NRCS will provide technical assistance, as needed)
- ☐ (If prescribed burning is used) Prior to implementation, in combination with grazing to manage vegetation, develop or update a prescribed burn plan to guide the frequency and duration of burning. Provide to NRCS. (NRCS will provide technical assistance, as needed)
    - o Prior to implementation of a prescribed burn, assess the existing fuel load using appropriate tools and methods for the geographic area. Determine the need for pre-treatment of the vegetation and fuels to facilitate a desired fire intensity to achieve the vegetation objectives. Apply as needed, complimentary NRCS Conservation Practice Standards such as Firebreak (Code 394) and Woody Residue Treatment (Code 384) to achieve appropriate conditions. (NRCS will provide technical assistance, as needed)
    - o Prior to implementation, acquire a written burn plan for the enrolled land use acres that meets the NRCS Conservation Practice Standard Prescribed Burning (Code 338) and any additional state NRCS requirements. Provide to NRCS for review and approval.
    - o Prior to implementation of a prescribed burn, acquire all necessary approvals and permits (local, state, federal as applicable).
    - o During implementation, and prior to ignition of each prescribed burn, acquire a current fire weather forecast and ensure all weather conditions are within those prescribed in the written burn plan. If conditions are not within prescription, postpone burn.
    - o During implementation, and prior to ignition of any prescribed burn, notify NRCS to confirm NRCS verification for any planned changes will meet NRCS or State required enhancement criteria.
    - o After implementation of each prescribed burn, conduct a post-burn evaluation as required within the burn plan and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

- During implementation, install and maintain erosion control measures as needed for the site. (NRCS will provide technical assistance, as needed.)
- After implementation, provide NRCS documentation of the vegetation established and timing of grazing activities on the fuel break.

NRCS will:

- Prior to implementation, as needed, provide technical assistance in determining sites for enhancement implementation that meet specified criteria.
- Prior to implementation, NRCS will provide participant recommendations for suitable perennial and annual vegetation establishment and provide assistance in development or revision of a prescribed grazing plan.
- Prior to implementation, as needed, provide explanation and technical assistance to the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - Prescribed Burning (Code 338).
  - Fuelbreak (Code 383).
  - Firebreak (Code 394).
  - Woody Residue Treatment (Code 384).
  - Integrated Pest Management (Code 595).
  - Additional Conservation Practice Standards for erosion control, as needed for the site.
- (If prescribed burning is used) Prior to implementation, review and certify the prescribed burn plan meets the enhancement criteria and any additional state NRCS requirements.
- Prior to implementation, review the prescribed grazing plan to ensure objectives of the enhancement will be met when used in combination with all other practices.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- (If prescribed burning is used) After implementation of each prescribed burn, review the post burn evaluation provided by the participant. Discuss any encountered issues, and as needed, provide assistance for changes in planning and procedure for the remaining prescribed burns.
- After implementation, review documentation of the vegetation established and timing of grazing activities on the fuel break to verify the enhancement was implemented to meet the enhancement criteria.

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E391A

CONSERVATION STEWARDSHIP PROGRAM

Increase riparian forest buffer width for sediment and nutrient reduction

Conservation Practice 391: Riparian Forest Buffer

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial) and Associated Ag Land

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 15 Years

Enhancement Description

Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Criteria

- Existing buffer width shall be at least 35 feet or (if applicable) the minimum State buffer-width requirement, whichever is greater. Maximum enhancement buffer width may be increased up to the greater of 180 feet or the State-allowed maximum width.
- To the extent possible, the buffer area and extended buffer will be shaped and vegetated to increase overland flow interception.
- Excessive sheet-rill and concentrated-flow erosion will be controlled in the areas immediately adjacent and up-gradient of the buffer site. Overland flow through the riparian area will be maintained as sheet flow.

- Existing functional underground drains through the riparian area will be plugged, removed or replaced with perforated pipe/end plugs or water control structures.

- Dominant vegetation will consist of existing, naturally regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site and the intended purpose of nutrient reduction.

- Use tree and shrub species that are native and non-invasive. Substitution with improved and locally accepted cultivars or purpose-specific species is allowed. For plantings and seeding, only viable, high-quality and adapted plant materials will be used.

- Favor tree and shrub species that have multiple values such as those suited for timber, nuts, fruit, florals, browse, nesting, and aesthetics.

- Periodic removal of some forest products such as high value trees, medicinal herbs, nuts, and fruits is permitted provided the buffer area is not compromised by the loss of vegetation or harvesting disturbance.

- Necessary site preparation and planting shall be done at a time and manner to insure survival and growth of selected species.

- Harmful plant and animal pests present on the site will be controlled or eliminated as necessary to achieve and maintain the intended purpose. Pest management will be conducted in a manner that mitigates impacts to pollinators.

- Livestock shall be controlled or excluded as necessary to achieve the buffer's water quality improvement purpose. If livestock is present, follow a Prescribed Grazing Plan (CPS 528) and defer grazing for a minimum of two years.

- Design the expanded buffer enhancement for an expected life of at least 15 years.

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, prepare the planned buffer area according to the planting plan NRCS has developed with you. Refer to NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391). (NRCS will provide technical assistance)

☐ Prior to implementation, select planting date, method, and density/spacing appropriate for the site and soil conditions. (NRCS will provide technical assistance.)

Planting Date	
Planting Method	
Density and spacing	

☐ Prior to implementation, work closely with NRCS to select plant species that are adapted to your specific site and meet the goals of this enhancement.

Species	Vegetative or Rootstock	Size	Protection (tubes, mats, nets)

☐ During implementation and before planting, grade the site, as needed, to eliminate concentrated flow through the buffer including water coming from uphill of the buffer.

☐ During implementation and before planting, replace underground tile drains that pass through the buffer with rigid, non-perforated pipe or install a water control device that allows for overflow management.

☐ During implementation, install and maintain erosion control measures as needed, such as silt fencing and mulching.

☐ During implementation, conduct planting of selected species according to dates, methods, spacing and other requirements listed in the planting plan.

☐ During implementation, notify NRCS of any planned changes to allow NRCS to verify that the changes meet NRCS enhancement criteria.

- ☐ After Implementation, control harmful pests and vegetation and in a manner that limits effects to pollinators. Inspect and maintain tubes and protection measures regularly.

- ☐ After implementation, livestock and wildlife may need be controlled or excluded to achieve the buffer's water quality improvement purpose. If livestock are present, follow a Prescribed Grazing Plan (Code 528) and defer grazing for a minimum of two years. Wildlife may need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.

NRCS will:

- ☐ Prior to implementation, verify the enhancement is planned for cropland.

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391) to show how it relates to this enhancement.

- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included in the planting list.

- ☐ Prior to implementation, NRCS will provide technical assistance on:

    - Preparing a site preparation and planting plan that meets NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391) and lists the species, vegetation type, density, protection measures, and planting dates.

    - Selecting planting techniques and timing appropriate for the site and soil conditions.

    - Assessing impacts of drainage removal/plugging on adjacent land units and uses.

    - Preparing specifications for applying this enhancement for each site using approved state implementation requirements, national technical notes, appropriate state technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- ☐ During implementation, review any planned changes to ensure they meet the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications provided to the participant.
- ☐ After implementation, verify that any underground drains through the riparian area, if they exist, were plugged, removed or replaced with perforated pipe/end plugs or structures for flow control.
- ☐ After implementation, verify the vegetation was established and any protections required are being maintained according to the specifications provided to the participant.
- ☐ After implementation verify livestock are controlled or excluded as necessary to achieve the buffer's water quality improvement purpose. If livestock are present, verify a Prescribed Grazing Plan (Code 528) is being followed and that grazing is being deferred for a minimum of two years.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449A

CONSERVATION STEWARDSHIP PROGRAM

Complete pumping plant evaluation for water savings

CONSERVATION PRACTICE: 449 - Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 years

Enhancement Description

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more.

Criteria

- Pump test evaluation will include all irrigation pumps on fields where the activity is implemented. There could be multiple pumps that are used on single or multiple fields.

- Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season.
  - Pressure at different flow rates based on partial or complete irrigation.
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated.
  - Estimate of friction loss in pipelines based on pressure drop in lines during test.

- The irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice, Irrigation Water Management (Code 449):
  - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
  - Methods used to measure or determine the flow rate or volume of the irrigation applications.

- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- The Irrigation water management plan explains:
  - How irrigation system meets crop needs, while maximizing irrigation water efficiency.
  - Seasonal or annual planned water application volumes by crop.
  - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
  - Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
  - Information on how to recognize irrigation induced erosion and how to mitigate it.
  - Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
  - Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station
- Recordkeeping documents for the irrigator to use during operation and management.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.

- ☐ Arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.

- ☐ Acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.

CONSERVATION STEWARDSHIP PROGRAM

During implementation

- ☐ Follow the irrigation water management plan and keep records as required by the plan.
- ☐ Have a pump test evaluation performed on all irrigation pumps on fields where activity is implemented.

After implementation

- ☐ Make the following items available for review by NRCS to verify implementation of the enhancement:
  - Irrigation water management plan and records kept.
  - Pump test evaluation report(s).
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation. Calculate the reduction of water use based on before and after conditions.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) to participant as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.

After implementation

- ☐ Verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E449C

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 2-5, soil moisture monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

Criteria

Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

- An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
- Methods used to measure or determine the flow rate or volume of the irrigation applications.
- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- Irrigation water management plan explains:

- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- How data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station

- Recordkeeping documents for the irrigator to use during operation and management.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (449) requirements.

- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.

- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
  - o Irrigation water management plan and records kept
  - o Changes made to address distribution uniformity deficiencies

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (CPS 449) as it relates to implementing this enhancement

- ☐ As needed, provide additional technical assistance to the participant as requested.

- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing participant records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449D

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 1, Equipment and soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management

Criteria

- Equipment may include; weather station, sensors, flow meter, data loggers, cellular service, as needed to monitor soil moisture, determine and forecast crop water use and remotely control irrigation system.
- Subscription service provided by others may be used as an alternative.
- Data to be monitored includes crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment, and a data logger to log continuous weather data including rainfall, temperature, solar radiation, humidity, wind

speed and soil moisture/water level sensors data that can be downloaded to a personal computer and associated graphing software.

- Producer monitors the station during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensors, field checks and weather station data.

- Producer keeps records of collected data and resulting irrigation decisions. This enhancement only applies to year one of IWM. The appropriate labor-only IWM enhancements apply in subsequent contract years.

- If a weather station is installed, install within 1 mile of fields where practice is implemented. The weather station will record each of the following (at a minimum of four times per hour),
    - o High and low temperature
    - o Precipitation
    - o Humidity
    - o Wind speed and duration
    - o Solar radiation

- Sensors, datalogger and required telemetry are installed on fields where practice is implemented as indicated in the Irrigation water management plan.

- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - o An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
    - o Methods used to measure or determine the flow rate or volume of the irrigation applications.
    - o Measurement records showing the amount of water used to irrigate, as it comes onto the farm and goes to each field.
    - o Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
    - o The Irrigation water management plan explains;

CONSERVATION STEWARDSHIP PROGRAM

- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station.

o Recordkeeping documents for the irrigator to use during operation and management

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- ☐ Prior to implementation, acquire NRCS approval of selected weather station, sensors, data logger, etc. or subscription service.
- ☐ During implementation, ensure installation meets manufacturer recommendations.
- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
    - o Irrigation water management plan and records kept (i.e. , date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data)
    - o Changes made to address distribution uniformity deficiencies
    - o Documentation of equipment installed (i.e. weather station, sensors, data logger, etc.) to NRCS
    - o If a suscription service is used, provide location of equipment, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement
- ☐ As needed, provide additional assistance to the participant as requested.
- ☐ Prior to implementation, review and approve producer's selected weather station, sensors, data logger, etc. or subscription service.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ After implementation, verify installation of weather station, sensors, etc.
- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449F

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Year 1, Equipment with Soil moisture or Water Level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

This activity involves monitoring soil moisture or water levels within a surface irrigated field for intermediate irrigation water management by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment is installed and utilized to log data and retrieve the data periodically throughout the season, so irrigation decisions can be made based on scientific data. Maximum time between data retrievals is weekly.

Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.

Criteria

General

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall,

temperature; water level sensor with data collection system; permanent flowmeter

- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment with data collection systems that can continuously record data throughout the irrigation season.
- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used) and soils.
    - Method used to measure or determine the flow rate or volume of the irrigation water applications
    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field
    - Documentation of the scientific method used to schedule the timing and amount of irrigation application
    - Irrigation water management plan explaining:
        - How irrigation meets crop needs while maximizing irrigation water efficiency
        - Seasonal or annual planned water application volumes by crop
        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth
        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation
        - Information on how to recognize irrigation induced erosion and how to mitigate it
        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions
        - Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station

- Recordkeeping documents for the irrigator to use during the operation and management

CONSERVATION STEWARDSHIP PROGRAM

Additional Criteria of soil moisture devices

- Installation of each soil moisture set will include the ability to collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region
- Number of soil moisture sets will be installed based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of flow measurement devices

- Permanent flow meters will be installed at all wells/relifts that are included in the approved IWM plan

Additional Criteria of water level devices

- Sensor is installed in a basin field with a data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day

Additional Criteria of weather stations

CONSERVATION STEWARDSHIP PROGRAM

- Weather station is installed in a central location as defined by the irrigation water management plan, but no more than 2 miles separation

- Weather stations will record each of the following at a minimum of four times per hour:
  - High and low temperature
  - Precipitation
  - Humidity
  - Wind speed and duration and direction
  - Solar radiation

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- Acquire an irrigation water management plan meeting NRCS Conservation Practice Irrigation Water Management (Code 449) requirements
- Acquire NRCS approval of all irrigation water management devices that will be utilized for the plan implementation

During installation or implementation

- Ensure each irrigation water management device is installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- Monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data

After implementation

- Make the following items available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan is followed, and records kept
    - Changes made to address distribution uniformity deficiencies
    - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation

NRCS will:

Prior to implementation

- Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement

CONSERVATION STEWARDSHIP PROGRAM

- Provide additional assistance to the participant as requested
- Review and approve producer's selected equipment After Implementation
- Verify installation of all irrigation water management equipment
- Verify implementation of the irrigation water management plan by:
    - Reviewing records kept during enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449G

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Years 2-5, Soil Moisture or Water Level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment was bought in year one and is utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly.

Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.

Criteria

General

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system

- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- Irrigation water management plan from year one is followed in accordance to the NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used) and soils.
    - Method used to measure or determine the flow rate or volume of the irrigation water applications
    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field
    - Documentation of the scientific method used to schedule the timing and amount of irrigation application
    - Irrigation water management plan explaining:
        - How irrigation meets crop needs while maximizing irrigation water efficiency
        - Seasonal or annual planned water application volumes by crop
        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth
        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation
        - Information on how to recognize irrigation induced erosion and how to mitigate it
        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions
        - Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station
    - Recordkeeping documents for the irrigator to use during the operation and management

Additional Criteria of soil moisture devices

- Each year re-install the soil moisture set to collect data at a minimum of 2 approved

depths based on crop and soil characteristics of the region

- Number of soil moisture sets will be installed based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of water level devices

- Re-install sensor/gage each year in a basin field with a data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation

- Review the irrigation water management plan to make any necessary adjustments from the previous year.
- Ensure the irrigation water management plan continues to meet the NRCS Conservation Practice Irrigation Water Management (Code 449) requirements.

During installation or implementation

- Ensure each irrigation water management device is re-installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- Monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data

After implementation

- Make the following items available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan is followed, and records kept
    - Changes made to address distribution uniformity deficiencies
    - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation

NRCS will:

Prior to implementation

- Provide and explain NRCS Conservation Practice Standard Irrigation Water

Management (Code 449) as it relates to implementing this enhancement

- Provide additional assistance to the participant as requested After Implementation
- Verify re-installation of all irrigation water management equipment each year
- Verify implementation of the irrigation water management plan by:
    - Reviewing records kept during each year of enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E449H

Intermediate IWM— Years 2 -5, using soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Monitoring soil moisture or water levels within an irrigated field for implementing an intermediate irrigation water management plan using soil moisture data to facilitate management decisions.

Criteria

- Equipment previously installed (through preceding enhancement) must include soil moisture sensors with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system; and permanent flowmeter.
- Monitoring of the following items required:
    - Irrigation water applied
    - Crop water use
    - Status of heat and/or frost conditions to permit the producer to make informed irrigation decisions

CONSERVATION STEWARDSHIP PROGRAM

- Perform regular maintenance and monitoring of equipment with data collection systems that continuously record data throughout the irrigation season.

- Follow an irrigation water management plan which includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used), and soils.

    - Method used to measure or determine the flow rate or volume of the irrigation water applications.

    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field.

    - Documentation of the scientific method used to schedule the timing and amount of irrigation application.

    - Irrigation water management plan explaining:

        - How irrigation meets crop needs while maximizing irrigation water efficiency.

        - Seasonal or annual planned water application volumes by crop.

        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.

        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation.

        - Information on how to recognize irrigation induced erosion and how to mitigate it.

        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions.

- Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station.

  - Record keeping documents for the irrigator to use during the operation and management.

Additional Criteria of Soil Moisture Devices

- Soil moisture sensors collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region.
- Number of soil moisture data sets will be based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of Flow Measurement Devices

- Permanent flow meters data collected at all wells/relifts that are included in the approved IWM plan.

Additional Criteria of Water Level Devices

- Data from sensors installed in a basin field from data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Additional Criteria of Weather Stations

- Weather station data from a central location as defined by the irrigation water management plan
- Weather station record includes each of the following at a minimum of four times per hour:
  - High and low temperature
  - Precipitation

- Humidity
- Wind speed and duration and direction
- Solar radiation.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- ☐ During implementation, ensure each irrigation water management device functions as intended.
- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- ☐ During implementation, monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data.
- ☐ After implementation, make the following documentation available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan and associated records.
    - Changes made to address distribution uniformity deficiencies.
    - Documentation demonstrating utilization of any sensor used throughout the growing season.

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements as it relates to implementing this enhancement, including applicable state specific job sheets.
- ☐ Prior to implementation, assist with data interpretations needed for management decision making.
- ☐ Prior to implementation, provide additional assistance to the participant as requested.

☐ After implementation, verify implementation of the irrigation water management plan by reviewing records kept during enhancement implementation.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449I

CONSERVATION STEWARDSHIP PROGRAM

IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation System

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

This enhancement consists of retrofitting an existing sprinkler irrigation system to integrate variable rate irrigation (VRI) speed control where the technology is not present. The added functionality of VRI speed control equipment allows for enhanced water application precision, efficiency, and uniformity along the length of the sprinkler irrigation system by varying the irrigation system speed within the irrigation pass. Renovation of the existing sprinkler irrigation system utilizing this enhancement includes the installation of an upgraded control panel capable of speed control programming and global positioning system (GPS) technology capable of providing real-time field position. Utilization of the VRI speed control and GPS equipment will be for the entire irrigation season and be based on spatially identified parameters such as variations in past yield data, soils, crop growth, topography, or computerized irrigation scheduling recommendations. This scenario requires that the existing sprinkler irrigation system meets Conservation Practice Standard (CPS) 442 uniformity and efficiency requirements. System equipment is installed in year 1 with this scenario and scenario E449G or E449C is used in years 2-5.

Criteria

- Documentation that ensures the speed control devices are compatible with the existing sprinkler irrigation system.
- Detailed drawings on how the speed control and GPS devices will connect to the existing sprinkler irrigation system, operate safely, and be protected.
- Irrigation water management (IWM) plan that follows the NRCS Conservation Practice Standard Irrigation Water Management (CPS449).
- The installation includes the purchase and installation of speed control and GPS devices. Components necessary for retrofit depend on the type of devices are installed and sprinkler irrigation system being renovated, but should consist of speed control and GPS devises as indicated below:

- Speed control unit with percentage timer setting capable of varying the irrigation system speed within the irrigation pass. Sprinkler irrigation tower speed is controlled by contactor coil voltage sent out by the percentage timer within the control panel.
- Satellite-guided GPS technology mounted on the sprinkler irrigation system provides real-time end tower location, speed, and direction information to the control panel.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Acquire an IWM plan meeting NRCS CPS Irrigation Water Management (Code 449) requirements.
- ☐ Develop a map delineating the location of the existing sprinkler irrigation system, speed control unit, satellite-based technology, and the fields they serve.
- ☐ Acquire NRCS approval of selected of selected speed control unit and satellite-based technology.

During implementation

- ☐ Ensure installation meets manufacturers recommendations.
- ☐ Provide documentation ensuring that the speed control device, GPS device, and supporting appurtenances allow the sprinkler irrigation system to operate safely and in the range of design operating conditions.
- ☐ Provide documentation of the protective structures meeting the requirements of the speed control and GPS devices. Ensure that the protective devices meet NRCS standards.
- ☐ Record each irrigation event, including the amount or depth of water applied, duration of the event, date of application, and any other requirements of the approved IWM Plan.

After implementation

- ☐ Copy of the record of each irrigation event, including the amount or depth of water applied, duration of the event, date of application, and any other requirements of the approved IWM plan.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement.
- ☐ Provide and explain NRCS Conservation Practice Standard Sprinkler System (Code442) as it relates to implementing this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Provided additional assistance to the participant as requested.

- ☐ Review and approve producer's selected equipment

During Implementation

- ☐ Provide additional assistance to the participant as requested.

After Implementation

- ☐ Verify installation of the speed control devices, GPS devices, and supporting appurtenances are in accordance with manufacturer's specification.
- ☐ Verify that speed control and GPS devices are compatible with the existing sprinkler irrigation system.
- ☐ Verify implementation of the approved IWM plan by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484A

Mulching to improve soil health

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health – increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical, and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least four different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Use plant-based mulching materials of suitable quantity and quality to add organic matter, provide food and shelter for soil biota, and protect the soil surface from raindrop impact and crusting while allowing for adequate soil aeration.
- Apply plant-based mulching materials with a carbon to nitrogen ratio (C:N) less than 30 to 1 to reduce soil nitrogen immobilization by soil biota (typical ratio examples – hairy vetch cover crop 11:1, fresh grass clippings 17:1, mature alfalfa hay 25:1, corn stalks 60:1, wheat straw 80:1, and pine needles 80-110:1).
- Do not apply mulch with C:N less than 20:1 to an area of designed flow in watercourses.

CONSERVATION STEWARDSHIP PROGRAM

- The crop rotation includes at least four crops and/or cover crops grown in a sequence.
- An evaluation of the system using the current approved SCI procedure results in zero or higher.
- Use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop. The crop rotation must include at least four crops and/or cover crops grown in a sequence.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Application Date

☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

CONSERVATION STEWARDSHIP PROGRAM

☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

☐ If changes were made to crop rotation or tillage operation(s) after implementation, complete the tables above to document the changes.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, verify that the crop rotation includes at least four crops and/or cover crops grown in a sequence.

☐ Prior to implementation, use information provided from the participant to calculate the Management SCI value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**

☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ If changes were made from the planned system after implementation, use information provided from the participant to calculate Management SCI value to document that the applied system met the enhancement criteria. **Management SCI Value = _____**

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484B

Reduce particulate matter emissions by using orchard or vineyard generated woody material as mulch

Conservation Practice: 484 Mulching

APPLICABLE LAND USE: Crop (perennial)

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Reduce particulate matter emissions by using orchard- or vineyard-generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. *An exception may be made when it is determined that infected material must be burned to preserve crop health.*

Criteria

- Non-infected, woody material will not be burned, but instead will be chipped and used as mulch. Infected material may be burned to preserve crop health, but 90% of all woody material must be mulched in order to count this enhancement as met.
- When mulching with wood products such as wood chips, bark, shavings, or other wood materials, apply a minimum two-inch thickness of particles that will remain in place during heavy rainfall or strong wind events, or both, if applicable.
- Mulching plan must be developed. Mulched material must meet guidelines laid out in a mulching plan for size of chips and thickness of cover applied.
- Mulch does not have to be applied to the immediate source area (orchard or vineyard), but instead may be applied anywhere needed on the operation that is designated in the mulching plan (e.g., other areas of farmstead or cropland).
- Avoid excessively thick or tightly packed mulches that can results in soggy, anaerobic conditions at the soil surface during wet weather or prevent rainfall or

overhead irrigation from reaching the soil during times of moisture deficit.

- Keep mulch three to six inches away from plant stems and crowns to prevent disease and pest problems. Additional weed control may be needed around the plant base area.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with information for review about current and proposed management of orchard or vineyard generated woody materials.

Field	Crop	Acres	Current Management	Proposed Management

☐ Prior to implementation, provide NRCS with the proposed mulching plan for development. NRCS can provide assistance, as needed, in plan development. At a minimum, the plan must include:

- Purpose of mulching
- Type of mulch material
- Approximate amount of mulch material to be utilized
- Size of mulch pieces (size range or maximum size of pieces)
- Placement timing (planned and actual)
- Depth of mulch cover
- Any required site preparation
- Operation and maintenance information
- Map(s) of area where material is to be applied

Field	Crop/Location	Mulching Material	Planned Mulching Depth or Rate of Application (inches or pounds/acre)	Planned Application Date

- ☐ During implementation, notify NRCS of any planned changes in the mulching plan to verify changes meet the enhancement criteria.

- ☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

- ☐ During implementation, take photos of area mulched that document the average size of mulched material and depth of layer applied.

- ☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Mulching Depth or Rate of Application (inches or pounds/acre)	Actual Application Date

- ☐ After implementation, provide mulching plan and photos for review of the area(s) mulched to document the average size of mulched material and depth of layer applied and to verify the planned system meets the enhancement criteria.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

- ☐ Prior to implementation, review current and proposed management of orchard- or vineyard-generated woody materials. *Plan/contract the actual acres of the crop producing the woody materials to be managed.*

- ☐ Prior to implementation, verify that the mulching plan meets all criteria of the enhancement.

- ☐ During implementation, evaluate any planned changes in the mulching plan to ensure enhancement criteria are met.

- ☐ If changes were made after implementation, use information provided from the participant to verify the applied system meets the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E484C

CONSERVATION STEWARDSHIP PROGRAM

Mulching with natural materials in specialty crops for weed control

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (annual & mixed), Crop (perennial)

RESOURCE CONCERN ADDRESSED: Plants

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Application of straw mulch or other state-approved natural material (such as wood chips, compost, green chop, dry hay, or sawdust) for weed control in specialty crops.

Criteria

Use mulch of sufficient ground cover, thickness, and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests. Mulch thickness will be determined by the size of the plant being mulched. Thickness of the mulch shall be adequate to prevent emergence of targeted weeds, but no less than four inches deep for dry mulches.

Grass-based green chop should be applied no greater than three inches deep as it will compact and rot. Add additional layers of green chop as decomposition occurs to maintain weed control. Do not use green chop from areas recently treated with herbicides.

Mulches shall be kept a minimum of three inches away from the stems of plants where disease is likely to occur. Depending on the crop, mulch distance may need to be up to six inches away from the stems.

Mulches applied around growing plants or prior to weed seedling development shall have 100%ground cover.

Avoid finely divided residues (e.g. sawdust) and those rich in soluble carbohydrates (e.g. fresh chopped corn or other grasses) with a carbon to nitrogen ratio (C:N) greater than 30 that tie up soil nitrogen (N) and necessitate supplemental N applications.

Avoid excessively thick or tightly packed mulches that can interfere with the movement of ground beetles and other beneficial organisms and may result in soggy, anaerobic conditions at the soil surface and increase the incidence of crop pests and diseases.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide a map showing location of mulch application.
- ☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that will provide weed suppression and do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Depth of Mulch (inches)	Planned Application Date

- ☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to ensure enhancement criteria are met.
- ☐ During implementation, take photos of mulch after application, during the growing season, and at harvest.
- ☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- ☐ During implementation, maintain all receipts or other records showing the quantity of mulch used.
- ☐ After implementation, provide NRCS with the applied mulching information and any additional information related to the mulching impacts on weed control or crop production.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify mulching materials to be used, depth of mulch, and quantity needed, and document on implementation requirements.
- ☐ Prior to implementation, use information provided from the participant to calculate the Management Soil Conditioning Index (SCI) value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**
- ☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to ensure enhancement criteria are met.
- ☐ After implementation, review the applied mulching information and records and recommend adjustments to the mulch specifications for subsequent years based on success of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E511C

CONSERVATION STEWARDSHIP PROGRAM

Forage testing for improved harvesting methods and hay quality

Conservation Practice 511 Forage Harvest Management

APPLICABLE LAND USE: Perennial cropland (hayland) and Pasture

RESOURCE CONCERN: Animals, Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Dry hay forage samples are collected and analyzed following LGU procedures. Analysis results are kept and used to improve harvest decisions to guide forage supplementation of on-farm livestock to meet nutritional needs and improve health and productivity.

Criteria

- This enhancement only applies to hay harvested on-farm.
- Develop a plan to harvest hay in a manner that protects stand longevity and maintains or improves forage quality. Plans must include specifications for harvest timing, handling prior to baling, and storage options to best preserve forage quality.
- At least **2 consecutive** cuttings will be required of the same forage type, but additional testing may be needed and should follow the Cooperative Extension or other specialist/nutritionists' recommendations and documented in the plan.
- Collect hay samples consistent with land grant university or accredited lab protocol for tissue sampling for each harvest cycle. Consult the National Forage Testing Association list of Certified Labs- https://www.foragetesting.org/links for more assistance.

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- Complete a record keeping document that will include all the following at a minimum for each cutting:
    - Date and time of harvest AND date of baling
    - Forage type
    - Maturity stage/description during harvest including harvest height
    - Curing and handling prior to baling (number of tedding, raking, and/or merging operations)
    - Moisture during harvest
    - Bale type (Large square, Round, Small Square)
    - Storage type (indoor, poly-wrapped, tubed, tarped, net wrapped, unprotected etc.)
    - Crude protein
    - Fiber (NDF/ADF)
    - Ash
    - Total Digestible Nutrients (TDN)
    - Relative feed value (RFV)
    - Additional recommended tests (where available): NDF-Digestibility (30-hour recommended) and nitrates.
- Provide record keeping documents and hay test results to NRCS office.
- Discuss results with local Cooperative extension educator or livestock nutritionist, provide any recommendations to NRCS office for all harvesting cycles.
- Use results to improve harvesting decisions.
- Use hay analyses to guide forage supplementation to on-farm livestock.

Adoption Requirements

This enhancement is considered adopted when the criteria is met, and documentation records are provided.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, develop a map delineating the fields selected for gathering the hay analysis and record keeping documentation.
- ☐ Prior to implementation, ensure forage harvesting tool/machinery is capable of cutting the forage at the desired residual height without compromising plant vigor and stand longevity.
- ☐ Prior to implementation, develop a plan to harvest hay in a manner that protects stand longevity and maintains or improves forage quality and maintains adequate stubble. Plans must include specifications for harvest timing, handling prior to baling, and storage options to best preserve forage quality. Refer to NRCS Conservation Practice Standard Forage Harvest Management (Code 511).
- ☐ Prior to implementation, provide the forage harvest and forage sampling plan to NRCS for review. Two consecutive cuttings of the same forage type will be evaluated, preferably on the same field, unless the first harvested species will be different than the second harvest on the same field, (for example cool season species fields that transition to warm season forage later in the season). The first cutting must be tested after harvest and is one of the two required. Management decisions must be made from the first test to determine how to improve forage quality for the next cutting. Record keeping should be completed for each cutting and a report completed. Additional testing may be needed and should follow the Cooperative Extension or other specialist/nutritionists' recommendations and documented in the plan.
- ☐ During implementation, collect the number of forage samples on mapped field/s during each harvest cycle and send to a land grant university or accredited lab for tissue analysis.
- ☐ During implementation, keep records including all items under criteria.
- ☐ During implementation, discuss results and implement technical recommendations from Cooperative Extension, nutritionist or NRCS.

- ☐ During implementation, use analysis results and data to improve/adjust forage harvesting activities for the next harvest cycle.

Example: Ash content above internal sources (calcium, magnesium, potassium, phosphorus); adjust cutting and/or rake heights to reduce external sources (dirt, bedding, etc.), use cutting heights and harvest timing to positively affect fiber level, change harvest timing to increase protein and NDF-d levels etc.

- ☐ During implementation use data collected from on-farm hay analysis to improve supplemental feeding periods for animals' health and productivity.
- ☐ After implementation, provide tissue analysis and all record keeping documentation to NRCS
- ☐ After implementation, provide technical recommendations from Cooperative Extension or other specialist/nutritionist to NRCS.
- ☐ After implementation, provide report on how the data enabled improvements to hay harvest and feed supplementation efficiency.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Forage Harvest Management (Code 511) as it relates to this enhancement.
- ☐ Prior to implementation, verify map and crop/hayfields where enhancement will apply.
- ☐ Prior to implementation, provide assistance in determining the forage cutting to be sent for analysis in addition to the required first cutting.
- ☐ Prior to implementation, provide assistance in determining the planned number of hay samples above the required 2.

- ☐ During implementation, verify management changes in harvest management have positively affected test values in the forage analysis results. Positive effects are but not limited to increases in crude protein levels, NDF-D and TDN values and/or lowering of NDF/ADF and Ash levels.

- ☐ After implementation, verify the hay harvest and hay analysis activities and record keeping meet the specifications of this enhancement.

- ☐ After implementation, review data driven report for hay harvest and supplemental feeding improvements.

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CONSERVATION ENHANCEMENT ACTIVITY

E528C

CONSERVATION STEWARDSHIP PROGRAM

Incorporating wildlife refuge areas in contingency plans for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

Criteria

- A written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife will be followed.
- Enhance diversity of rangeland plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
  - Clear objectives,
  - A resource inventory of structural improvements, existing resource conditions, and forage inventory.
  - Grazing plan, and

  - A contingency plan
  - A monitoring plan

- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Identify wildlife species of concern in the objectives of the prescribed grazing plan.
- An area that constitutes at least 15% of the planned enhancement acreage (or a minimum of ten acres, whichever is larger) that is predominantly native grasses and/or legumes and/or perennial forbs will be rested from all harvest by livestock or prescribed burning for a period of 12 months or longer.
- The rested area must be a grazing unit (or located in a grazing unit) that scores a minimum of 0.5 on the state NRCS Wildlife Habitat Evaluation Guide (WHEG).
- The rested area can be used to stockpile forages to build reserves for livestock forage after the 12-month rest period.
- In the event the designated refuge area gets utilized by livestock during a drought/disaster emergency or other contingency situation, during the life of the contract, it must be restored or let recover or another pasture designated and rested for 12 months following the emergency utilization.
- Water must be made available for the wildlife species of concern designated in the grazing plan in the refuge area or nearby where the refuge provides needed cover for water access.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, review NRCS Conservation Practice Standards Prescribed Grazing (Code 528) and Upland Wildlife Habitat Management (Code 645), including any state approved job sheets or work sheets.
- ☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
- ☐ Prior to implementation, provide locations of water access.
- ☐ Prior to implementation, obtain grazing/wildlife habitat management plan specifying what species the enhancement is targeting and how grazing management is being modified to benefit that species. The written grazing plan must describe the management and harvest of vegetation with grazing and/or browsing animals, what conditions create the need to implement a contingency plan, and what monitoring method(s) will be used.
    - o The grazing plan will include a minimum of a 12-month rest period on 15% of enrolled acres incorporated into grazing strategy. Supporting documentation identifying baseline conditions will be based on state NRCS Conservation Practice Standard Prescribed Grazing (Code 528) specifications.
- ☐ During implementation, keep actual use records (dates, time, and number of head).
- ☐ During implementation, maintain water in the refuge area or nearby where the refuge provides needed cover for water access.
- ☐ During implementation, collect monitoring data used to determine contingency activation such as precipitation, drought, fire, and flooding or forage availability.
- ☐ During implementation, consult with NRCS to adjust and adapt the plan to current conditions to verify the changes meet enhancement criteria. Changes to the plan will be documented in writing.
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
    - o Grazing/wildlife habitat management plan.
    - o Monitoring data and actual use records.

CONSERVATION STEWARDSHIP PROGRAM

- Any documented changes to the plan as result of contingency or monitoring data.

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standards Prescribed Grazing (Code 528) and Upland Wildlife Habitat Management (Code 645) as they relate to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern: _____
WHEG score before implementation: _____
WHEG score after implementation: _____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ After implementation, review actual use and monitoring data used to implement grazing strategy and provide recommendations for adjustments, or additional practices to facilitate future improvements in wildlife habitat.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation: _____

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NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528D

CONSERVATION STEWARDSHIP PROGRAM

Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range, Forest

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of rangeland plants, generally found on the Ecological Site Description or otherwise documented by measurement protocol, to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
  - Clear objectives
  - Resource inventory with ecological site description or reference sheet and structural improvements and existing resource conditions,
  - Grazing plan, and

CONSERVATION STEWARDSHIP PROGRAM

  - A contingency plan.

- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Identify species of concern in the objectives of the prescribed grazing plan.
- Plan intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the identified wildlife species.
- Evaluate wildlife habitat with the state NRCS Wildlife Habitat Evaluation Guide (WHEG) and manage for a WHEG value of 0.60 or greater.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, obtain a written grazing plan (NRCS can provide assistance as needed). Plan must include:

- Clear goals and objectives of the plan, including identification of the specie(s) of concern and the plant functional groups providing structure and composition.
- Contingency plan for events that trigger adverse results.
- Forage/Animal Balance.
- A grazing plan narrative describing the basis for when livestock movement or rotation will occur, including deferment plans.
- Contingency plans for forage shortfalls.
- Monitoring locations, key species, and monitoring techniques.
- Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

☐ During implementation, keep the following documentation:

- Livestock herd management records with seasonally important phenological stages of plant growth relative to species of concern.
- Annually complete a forage utilization worksheet, such as NRCS Conservation Practice Standard Prescribed Grazing (Code 528) job sheet.
- Grazing intensity records for all key grazing areas that accommodate the criteria.

☐ During implementation, consult with NRCS to adjust and adapt the grazing plan to current conditions to verify the changes meet enhancement criteria. Changes to the grazing plan will be documented in writing.

☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, complete an assessment of the site with NRCS using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern:_____
WHEG score before implementation:_____
WHEG score after implementation:_____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation:_____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E528E

CONSERVATION STEWARDSHIP PROGRAM

Improved grazing management for enhanced plant structure and composition for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range; Forest; Associated Ag Land

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand.
- Removal of herbage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants, and the nutritional needs of the animals.
- Deferment (non-grazing period less than one year) and/or rest (non-grazing period equal or greater than one year) will be planned for critical periods of plant needs (such as post-planting or renovation, severe drought, etc.).
- Manage grazing and/or browsing animals to maintain adequate cover on sensitive areas (such as riparian areas, wetlands, habitats of concern, karst areas, etc.)

CONSERVATION STEWARDSHIP PROGRAM

- Manage livestock movements based on rate of plant growth, available forage, and allowable utilization target. Develop and follow contingency plans to deal with episodic disturbance events.
- Both the specie(s) of concern and the plant functional groups providing structure and composition will be identified in the objectives of the prescribed grazing plan.
- Plan the intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the desired fish and wildlife species of concern.
- Manage the afore-mentioned aspects of grazing events to maintain a minimum score of 0.60 when evaluated with the state NRCS Wildlife Habitat Evaluation Guide (WHEG).

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, obtain a written grazing plan (NRCS can provide assistance as needed). Plan must include:

- Clear goals and objectives of the plan, including identification of the specie(s) of concern and the plant functional groups providing structure and composition.
- Contingency plan for events that trigger adverse results.
- Forage/Animal Balance.
- A grazing plan narrative describing the basis for when livestock movement or rotation will occur, including deferment plans.
- Contingency plans for forage shortfalls.
- Monitoring locations, key species, and monitoring techniques.
- Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

☐ During implementation, keep the following documentation:

- Livestock herd management records with seasonally important phenological stages of plant growth relative to species of concern.
- Annually complete a forage utilization worksheet, such as NRCS Conservation Practice Standard Prescribed Grazing (Code 528) job sheet.
- Grazing intensity records for all key grazing areas that accommodate the criteria.

☐ During implementation, consult with NRCS to adjust and adapt the grazing plan to current conditions to verify the changes meet enhancement criteria. Changes to the grazing plan will be documented in writing.

CONSERVATION STEWARDSHIP PROGRAM

☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, complete an assessment of the site with NRCS using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern: _____
WHEG score before implementation: _____
WHEG score after implementation: _____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ Prior to implementation, explain the functionality of this enhancement with Enhancement E314A, if sequentially applicable.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation: _____

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E528F

CONSERVATION STEWARDSHIP PROGRAM

Stockpiling cool season forage to improve structure and composition or plant productivity and health

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Associated Agricultural Land; Crop (Perennial); Crop (Annual and Mixed)

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

Criteria

Additions to the current Prescribed Grazing Plan must include:

- A record of designated paddocks and acreages to exclude grazing for a stated specified time period.
- The acreage needed for stockpiled forage will be predetermined.
- Stockpiled acreage will be supplied nutrients according to a land grant university approved soil test to achieve adequate forage growth at the beginning of the stockpiling period.
- Stockpile will be grazed in a manner that maintains specified minimum forage heights in the grazing plan to avoid damage to soil or forage.

CONSERVATION STEWARDSHIP PROGRAM

- Do not allow livestock to access previously grazed stockpiled areas when spring regrowth begins until recommended forage heights exist.
- The NRCS Conservation Practice Standard Prescribed Grazing (Code 528) must be followed on all pasture each year this enhancement is in effect. Note - leaving recommended residual forage heights, even though plants are dormant, are needed for erosion control and wildlife.
- Certification recorded that practice requirements have been met after grazing of stockpiled forages is complete before the new growing season begins.

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, develop a prescribed grazing plan including a plan map that delineates where forage stockpiling will occur. Make these materials available to NRCS for review.
- ☐ After implementation, make grazing records and photo documentation of stockpiling and level of use available to NRCS.

NRCS will:

- ☐ Prior to implementation, review grazing plan and maps provided by participant.
- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review records and photos provide to confirm adequate stockpiling and acceptable levels of grazing use.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528I

CONSERVATION STEWARDSHIP PROGRAM

Grazing management that protects sensitive areas-surface or ground water from nutrients

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

Criteria

- A written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife will be followed.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes: 1) Clear objectives, 2) A resource inventory including a forage inventory, structural improvements, and existing resource conditions, 3) Grazing plan, and 4) A contingency plan.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.
- Plan the intensity, frequency, timing and duration of grazing and/or browsing that will:
    - Minimize deposition or flow of animal wastes into water bodies or sinkholes,
    - Minimize animal impacts on stream bank or shoreline stability,
    - Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff, and
    - Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
- Livestock feeding and watering facilities will be located and designed/installed in a manner to improve livestock distribution and avoid overland flow to sensitive areas.
- When nutrients are applied on pastureland, soil testing and nutrient application will be done according to local land grant university guidance or the equivalent there of.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan that identifies the following:
  - The goals and objectives of the plan
  - Forage/Animal Balance
  - A grazing plan narrative describing the basis for when livestock movement or rotation will occur.
  - Contingency plans for forage shortfalls.
  - Monitoring locations, key species, and monitoring techniques.
  - A map identifying all permanent pastures, water sources, and any riparian area or other sensitive areas improved or maintained by this management.

- ☐ Prior to implementation, a nutrient management plan will be developed if nutrients will be applied. The nutrient management plan will detail appropriate soil testing protocol and acceptable nutrient application amounts.

- ☐ Prior to implementation, a copy of the competed grazing plan will be submitted to NRCS for review and approval.

- ☐ During implementation, consult with NRCS or a qualified grazing professional to adjust and adapt the grazing plan to current conditions. Changes to the grazing plan will be documented in writing.

- ☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ Prior to implementation, assist the participant with development of a grazing plan and/or nutrient management plan, as requested.

- ☐ Prior to implementation, review the plan(s) if not developed by NRCS.

- ☐ Prior to implementation, review soil test analysis

- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review written grazing records provided by the participant to determine if the grazing plan was adequately followed to protect or enhance riparian areas, wetland areas, or other sensitive areas.
- ☐ After implementation, review the nutrient management plan and application record to ensure nutrients were applied according to the plan.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528J

CONSERVATION STEWARDSHIP PROGRAM

Prescribed grazing on pastureland that improves riparian and watershed function

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes: 1) Clear objectives, 2) A resource inventory including a forage inventory, structural improvements, and existing resource conditions, 3) Grazing plan, and 4) A contingency plan.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.
- Manage grazing and/or browsing to provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation by moving livestock appropriately.
- Graze and rest pastures appropriately and with the right numbers, class, and kind of livestock to maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.
- If nutrients are applied, soil testing and nutrient application will be done according to local land grant university guidance or equivalent.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan that identifies the following:
  - Goals and objectives of the plan
  - Forage/Animal Balance
  - A grazing plan narrative describing the basis for when livestock movement or rotation will occur.
  - Contingency plans for forage shortfalls.
  - Monitoring locations, key species, and monitoring techniques.
  - Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

- ☐ Prior to implementation, a nutrient management plan will be developed if nutrients will be applied. The nutrient management plan will detail appropriate soil testing protocol and acceptable nutrient application tolerances.

- ☐ Prior to implementation, a copy of the developed grazing plan will be submitted to NRCS for review and approval.

- ☐ During implementation, consult with NRCS or a qualified grazing professional to adjust and adapt the grazing plan to current conditions. Changes to the grazing plan will be documented in writing.

- ☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ Prior to implementation, assist the participant with development of a grazing plan and nutrient management plan if requested to do so. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation.

- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review written grazing records provided by the participant to determine if the grazing plan was adequately followed to protect or enhance riparian areas, wetland areas, or overall watershed function.
- ☐ After implementation, if nutrients have been applied, soil testing and application records will be reviewed to determine if nutrients have been applied responsibly.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528L

CONSERVATION STEWARDSHIP PROGRAM

Prescribed grazing that improves or maintains riparian and watershed function-erosion

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range, Forest

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Criteria

- Must follow a written grazing plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
    - Clear objectives,
    - A resource inventory of structural improvements, existing resource conditions, and forage.
    - A monitoring plan
    - A contingency plan

- Supplemental feed or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.
- Manage grazing or browsing so as to provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Maintain adequate ground cover and plant density through monitoring to retain or improve filtering capacity of the vegetation by moving livestock appropriately.
- Adjust grazing strategy and rest as needed with the right numbers, class, and kind of livestock to maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan with:
  - o Inventory of structural improvements, existing resource conditions and forage
  - o Guidelines and recommendations for matching the forage quantity and quality produced with the grazing and/or browsing demand of livestock
  - o A contingency plan and
  - o A monitoring plan
- ☐ During implementation, keep pasture/herd in/out records and forage-animal balance sheet.
- ☐ During implementation, monitor riparian vegetation for use
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
  - o Written grazing plan
  - o Pasture/herd in/out records
  - o Documented utilization records
  - o Monitoring plan

NRCS will:

- ☐ As needed, provide technical additional assistance to the participant as requested.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement.

- ☐ After implementation, verify implementation of the written grazing plan, by reviewing plan and pasture/herd in/out records and forage-animal balance sheets kept during enhancement implementation.
- ☐ After implementation, review the monitoring plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____

Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528R

CONSERVATION STEWARDSHIP PROGRAM

Management Intensive Rotational Grazing

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN ADDRESSED: PLANTS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Criteria

- Management-intensive rotational grazing increases harvest efficiency of vegetation with grazing and/or browsing animals through smaller paddock sizes, higher stock density while maintaining plant residue with enough energy reserves to recover quickly when adequate soil moisture is available for regrowth.
- Must develop and implement a written grazing plan that:
  - increases stock density
  - shortens grazing periods
  - enhances plant recovery
  - matches the forage quantity and quality produced with the grazing and / or browsing animal, and

  - increases harvest efficiency and manure distribution by significantly increasing the existing stock density per herd.

- Removal of forage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants and the nutritional needs of the livestock.

- Deferment (non-grazing period less than one year) and / or rest (non-grazing period equal to or greater than one year) will be planned for critical periods of plant needs.

- Manage livestock rotation based on rate of plant growth, available forage, and allowable utilization target.

- Manage livestock rotation to provide adequate ground cover and plant density to decrease soil erosion, reduce runoff and improve infiltration and water holding capacity.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.

- Utilize higher stock density and shorter grazing periods in riparian areas to minimize impact to stream bank or shoreline stability and ensure other sensitive areas such as wetlands, habitats of concern, karst areas do not become degraded.

- Implement and maintain a rotational grazing system using a combination of permanent or temporary division fences and water facilities to serve the management needs of operation.

- Develop and follow contingency plans to deal with drought or flooding or other episodic disturbance events.

Develop and implement a monitoring plan that at a minimum evaluates livestock performance, plant community composition and density, and soil function components such as ground cover, infiltration and aggregate stability.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementing, obtain a grazing plan map delineating the existing paddock system, along with a livestock inventory (type, class, average weight, and number) to document the current stocking density and current stocking rate.
- ☐ Prior to implementation, acquire a prescribed grazing plan, with a plan narrative delineating the following:
    - The goals and objectives of the plan
    - Map showing the number of paddock subdivisions with water sources, proposed stock densities per paddock associated with different herds in the system.
    - Forage Inventory
    - Forage / Animal Balance
    - A grazing plan narrative describing the basis for when livestock movement or rotation will occur
    - A contingency plan
    - A monitoring plan
- ☐ During implementation, keep pasture/ herd in/out records, stock density records and photos of paddock condition and photos of high stock density grazing implementation.
- ☐ After implementation, provide the following items for review by NRCS:
    - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
    - Paddock / herd in / out records with actual stock densities documentation.
    - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
    - Changes made to the grazing management plan.

NRCS will:

- ☐ As needed, provide technical assistance to participant as requested.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) and supporting documents that are needed to implement this enhancement, such as forage-animal balance forms.
- ☐ Prior to implementation, review the existing grazing plan, maps and livestock inventory provided by the participant.
- ☐ Review the newly proposed grazing plan fencing and watering layout, associated maps and stock density numbers for each herd.
- ☐ After implementation, review the following:
  - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
  - Paddock / herd in / out records with actual stock densities documentation.
  - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
  - Changes made to the grazing management plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533A

CONSERVATION STEWARDSHIP PROGRAM

Advanced Pumping Plant Automation

Conservation Practice 533: Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation. These decisions should be made in conjunction with an irrigation water management plan. Field measuring devices may be part of the IWM plan, but additional devices can be installed as part of the enhancement such as water level, fuel level, pressure, or speed control sensors.

Criteria

- Documentation that ensures the control devices is compatible with the exiting pump station and irrigation system
- Detailed drawings of how the control device will connect to the existing pump station
- Protective structure/mechanism
- Irrigation water management (IWM) plan that follows the NRCS Conservation Practice Standard Irrigation Water Management (CPS449)
- Components necessary for automation depends on the type of pump installed, but both electric and combustible system should have a flow meter as indicated below:
    - Electrical power unit- flow meter with data logger and telemetry, necessary circuit boards and protections, VFD (if applicable), antenna, modem, housing, and other appurtenances as applicable

- Diesel power units- flow meter with data logger and telemetry, necessary circuit boards and protections, antenna, modem, housing, fuel use meter, and other appurtenances as applicable.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Completed IWM plan, documenting guidance and landowner decision using State specific protocol
- ☐ Map delineating the location of the installed pumping plants, soil moisture sensors, electronic water level sensors, pipeline networks, permanent flow meters and fields they serve. All components should be capable of telemetry
- ☐ Digital/Printed photography of installed components and GPS location

During implementation

- ☐ Provide documentation ensuring that the control device and supporting appurtenances allow the pumping station to continue to operate safely and in the range of designed operating conditions
- ☐ Provide documentation of the protective structure(s) meet the requirement of the control device and supporting appurtenances. Ensure that the protective structures meet NRCS standards
- ☐ Record each irrigation event, and daily soil moisture/water level (if applicable) throughout growing season.
- ☐ Apply irrigation water based on irrigation scheduling method selected to meet the crop's needs and maximize irrigation water efficiency.
- ☐ Measure and record the amount of water used to irrigate as it comes onto the farm and is applied to each field.

After implementation

- ☐ Copy of the record each irrigation event, and daily soil moisture/water level (if applicable), and rainfall throughout growing season.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement
- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code449) as it relates to implementing this enhancement
- ☐ Provided additional assistance to the participant as requested

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Review and approve producer's selected equipment

After Implementation

- ☐ Verify installation of the control device and all supporting appurtenances
- ☐ Verify that the control device is compatible with the pumping station and the range of operation condition
- ☐ Verify implementation of irrigation water management plan by reviewing records kept during enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533B

CONSERVATION STEWARDSHIP PROGRAM

Complete pumping plant evaluation for energy savings

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to reduce energy use. Evaluate to determine if a Variable Frequency Drive motor controller(s) will reduce energy use and is feasible.

Criteria

- Pump test evaluation will include all irrigation pumps on the on fields where the activity is implemented. There could be multiple pumps that are used on single or multiple fields.

- Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season.
  - Pressure at different flow rates based on partial or complete irrigations.
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated.
  - Estimate of friction loss in pipelines based on pressure drop in lines during test.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation:

- ☐ Provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.
- ☐ Arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.

During implementation

- ☐ Have a pump test evaluation performed on all irrigation pumps that service the fields where activity is implemented.

After implementation

- ☐ Make the following items available for review by NRCS to verify implementation of the enhancement:
  - Pump test evaluation report(s).
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation. Calculate the reduction of energy use based on before and after conditions. Energy savings can be reported as the average annual or seasonal energy reduction compared to previous operating conditions.

NRCS will:

Prior to implementation

- ☐ Provide and explain Pumping Plant (Code 533) to participant as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.

After implementation

- ☐ Verify pump test evaluation, by reviewing evaluation report.
- ☐ Verify energy savings based on system efficiency before and after implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533C

CONSERVATION STEWARDSHIP PROGRAM

Install VFDs on pumping plants

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in the evaluation.

Criteria

- Implement recommendations for components from a pumping plant evaluation where the FVD is feasible, reduces energy use, and the existing or new electric drive unit will support the VFD.
- The replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.
- Components of this enhancement will meet the NRCS Conservation Practice Standard Pumping Plant (Code 533).

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation:

- ☐ Review pumping plant evaluation, season of use, existing pump motor needs, and current operation.
- ☐ Evaluate site specific energy alternatives and net benefit of the Variable Frequency Drive(s).
- ☐ Ensure that energy utility provider has reviewed and approved location of installation on pump motor, including needs for electrical harmonic filter.
- ☐ Obtain written documentation of utility approval for site with requirements for installation.

During implementation

- ☐ Ensure installation meets federal National Electrical Code and any local or state codes.

After implementation

- ☐ Provide documentation of installation including first season energy use for comparison to prior years to NRCS for review to verify implementation of the enhancement.
- ☐ Monitor and maintain system for the life span of the practice (10 years).

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ Review with the participant the costs and benefits of the installation of Variable Frequency Drive(s).
- ☐ Develop written specifications describing site specific details of installation, including:
    - The replacement or retrofit system and/or related components or devices.
    - Baseline system energy usage and potential energy savings from the implementation of this enhancement.
    - Plan view showing the location of the measures in relation to other structures or natural features, where appropriate.
    - Electrical wiring that meets the requirements of the National Electrical Code.
    - Operation and maintenance plan that is consistent with the purpose(s) of this practice, its intended life, and safety requirements.

CONSERVATION STEWARDSHIP PROGRAM

After implementation

- ☐ Verify energy savings based on system efficiency before and after implementation of the enhancement

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

CONSERVATION ENHANCEMENT ACTIVITY

E533D

CONSERVATION STEWARDSHIP PROGRAM

Switch fuel source for pumps

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 15 years

Enhancement Description

Switch the fuel source for the pump motor(s) to an on-farm renewable source (wind, solar, geothermal, etc.).

Criteria

- Replace an existing pump motor with a drive unit that is powered by a renewable source such as wind, solar, geothermal, etc. that can adequately maintain the existing operating conditions, flow rates and pressures.
- The replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.
- Components of this enhancement will meet the NRCS Conservation Practice Standard Pumping Plant (Code 533).

Documentation and Implementation Requirements

Participant will:

Prior to implementation:

- ☐ Evaluate current operating conditions of the existing pump(s) including season of use and motor needs.
- ☐ Evaluate site specific renewable energy alternatives.
- ☐ Evaluate options during lack of production of renewable energy source.

During implementation

- ☐ Ensure installation meets federal National Electrical Code and any local or state codes.

After implementation

- ☐ Monitor and maintain system for the life span of the practice (10 years).

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ Review with the participant the costs and benefits of conversion to renewable energy source.
- ☐ Develop written specifications describing site specific details of installation, including:
  - ☐ The replacement or retrofit system and/or related components or devices.
  - ☐ Plan view showing the location of the measures in relation to other structures or natural features, where appropriate.
  - ☐ Method used to protect existing power provider from back feed from renewable source.
  - ☐ Electrical components that meet the requirements of the National Electrical Code.
  - ☐ Operation and maintenance plan that is consistent with the purpose(s) of this practice, its intended life, and safety requirements.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E580A

CONSERVATION STEWARDSHIP PROGRAM

Stream corridor bank stability improvement

Conservation Practice 580: Streambank and shoreline protection

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Range; Forest; Farmstead; Associated Ag Land

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 20 years

Enhancement Description:

Stream corridor bank vegetation components are established to provide additional stream corridor bank stability.

Criteria:

- This enhancement can be applied to streambanks and adjacent floodplain/riparian area of natural channels where the channel is susceptible to erosion and migration.
- Stream corridor vegetative components must be established as necessary for ecosystem functioning and stability. The appropriate composition of vegetative components is a key element in preventing excess long-term channel migration in re-established stream corridors.
- Dominant vegetation will consist of existing, naturally-regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site. Vegetation established on channel banks and adjoining areas must be in accordance with NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- Vegetation cover that promotes sediment deposition should be used to help floodplain development and growth. Overland flow should be maintained as sheet flow through the adjacent floodplain/riparian area to prevent erosion and promote sediment deposition.

- Utilize vegetative species that are native and/or compatible with local ecosystems. Avoid introduced, invasive, noxious or exotic species that could become nuisances. Where possible, select plant materials that also provide habitat requirements for desirable wildlife and pollinators.
- Treatments should meet aesthetic and recreational objectives as determined by a site-specific assessment or management plan. Aesthetic objectives should be based on human needs, including visual quality, noise control, and microclimate control. Treatments should be designed to achieve recreation objectives as determined by a site-specific assessment or management plan. Safety requirements shall be based on type of human use and recreation objectives.
- Construction materials, grading practices, and other site development elements must be selected and designed to be compatible with adjacent land uses.
- Livestock exclusion must be considered during establishment of vegetative treatments and appropriate grazing practices applied after establishment to maintain plant community integrity. Wildlife may also need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.
- Design the stream corridor and bank vegetation enhancement for an expected life of at least 20 years. Protective treatments must be self-sustaining or require minimum maintenance.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, prepare the planned acres for tree or shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342). (NRCS will provide technical assistance, as needed.)

☐ Prior to implementation, select a combination of deep-rooted trees and shrubs appropriate for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration. If possible, select plant materials that also provide habitat for desirable wildlife and pollinators (NRCS will provide technical assistance, as needed.)

Species / Type	Number	Wildlife habitat characteristic(s), if any

☐ Prior to implementation, select arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

TASKS	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____
Planting Date					
Planting Technique					
Arrangement/Spacing					

☐ During implementation, use erosion control methods based upon specifications developed for the site.

☐ After implementation, protect the area from livestock until vegetation is well-established, and, if necessary, control wildlife access within state and local regulations.

☐ After implementation, conduct inspections after high flows and undertake prompt actions if there is excessive streambank or streambed instability or erosion.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately graded and prepared for tree and shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342).
- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.
- ☐ As needed, prior to implementation, NRCS will provide technical assistance for:
  - Selecting a combination of appropriate, deep-rooted tree and shrub species for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration.
  - Selecting appropriate arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions.
  - Planning the use of additional erosion control, as needed for the site.
  - Preparing specifications for applying this enhancement using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify the planned trees and shrub species were established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from livestock and, as necessary, from wildlife.
- ☐ After implementation, verify planned erosion control provided by the site is functioning and is maintained to specifications developed for the site.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E580B

CONSERVATION STEWARDSHIP PROGRAM

Stream corridor bank vegetation improvement

Conservation Practice 580: Streambank and shoreline protection

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Range; Forest; Farmstead; Associated Ag Land

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 20 years

Enhancement Description

Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

Criteria

- This enhancement can be applied to streambanks and adjacent floodplain/riparian area of natural channels where the channel is susceptible to erosion.
- Stream corridor vegetative components shall be established as necessary for ecosystem functioning and stability. The appropriate composition of vegetative components is a key element in preventing excess long-term channel migration in re-established stream corridors.
- Establishment of vegetation on channel banks and associated areas shall also be in accordance with NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- Utilize vegetative species that are native and/or compatible with local ecosystems. Avoid introduced, invasive, noxious or exotic species that could become nuisances.
- Select plant materials that provide habitat requirements for desirable wildlife and pollinators.

- Treatments shall be designed to achieve habitat and population objectives for fish and wildlife species or communities of concern as determined by a site-specific assessment or management plan. Objectives shall be based on the survival and reproductive needs of populations and communities, which include habitat diversity, habitat linkages, daily and seasonal habitat ranges, limiting factors and native plant communities.
- The type, amount, and distribution of vegetation shall be based on the requirements of the fish and wildlife species or communities of concern to the extent possible.
- Treatments shall be designed to meet aesthetic objectives as determined by a site-specific assessment or management plan. Aesthetic objectives shall be based on human needs, including visual quality, noise control, and microclimate control.
- Construction materials, grading practices, and other site development elements shall be selected and designed to be compatible with adjacent land uses.
- Treatments shall be designed to achieve recreation objectives as determined by a site-specific assessment or management plan. Safety requirements shall be based on type of human use and recreation objectives.
- Livestock exclusion shall be considered during establishment of vegetative treatments and appropriate grazing practices applied after establishment to maintain plant community integrity. Wildlife may also need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.
- Design the stream corridor and bank vegetation enhancement for an expected life of at least 20 years.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, prepare the planned acres for tree or shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342). (NRCS will provide technical assistance, as needed.)
- ☐ Prior to implementation, select a combination of deep-rooted trees and shrubs appropriate for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration. These plant materials should also provide habitat for wildlife, pollinators, and fish species as determined by a site-specific assessment or management plan (NRCS will provide technical assistance, as needed.)

Plant Species / Type	Number	Planted for what wildlife, pollinators, fish:

- ☐ Prior to implementation, select arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

TASKS	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____
Planting Date					
Planting Technique					
Arrangement/Spacing					

- ☐ During implementation, use erosion control methods based upon specifications developed for the site.
- ☐ After implementation, protect the area from livestock until vegetation is well-established, and, if necessary, control wildlife access within state and local regulations.
- ☐ After implementation, conduct inspections after high flows and undertake prompt actions if there is excessive streambank or streambed instability or erosion.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately graded and prepared for tree and shrub establishment. Refer to NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.
- ☐ As needed, prior to implementation, NRCS will provide technical assistance:
  - ○ Developing a Wildlife Habitat Management Plan for targeted suite of species.
  - ○ Meeting with participant to review the Wildlife Habitat Management Plan and plan and specifications.
  - ○ Selecting a combination of appropriate, deep-rooted tree and shrub species for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration and achieving habitat and species objectives.
  - ○ Selecting appropriate arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions.
  - ○ Planning the use of additional erosion control, as needed for the site.
  - ○ Preparing specifications for applying this enhancement using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify the planned trees and shrub species were established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from livestock and, as necessary, from wildlife.
- ☐ After implementation, verify planned erosion control provided by the site is functioning and is maintained to specifications developed for the site.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E590C

CONSERVATION STEWARDSHIP PROGRAM

Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Conservation Practice 590: Nutrient Management

APPLICABLE LAND USE: Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

Criteria

- Documentation of producer's record of nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- For nitrogen (N), phosphorus (P), and potassium (K), plan application rates using land grant university (LGU) recommendations or industry practices when recognized by the LGU. Lower-than-recommended nutrient application rates are permissible if the client's objectives are met.
- Geo-referenced map of all current and planned hay feeding areas, watering facilities, shelters, or other potential areas of animal concentration.

CONSERVATION STEWARDSHIP PROGRAM

- Minimize soil surface disturbance during fertilizer placement.
- **Utilize two or more nutrient use efficiency strategies or technologies** to reduce nutrient loss risk and improve nutrient use efficiency. Select two or more of the strategies and technologies below:
    - Split nutrient applications.
        - Apply no more than 50% of total forage N needs before green up of dormant grasses. Apply the remaining N after green up.
        - Additional nitrogen applications may be reduced or eliminated based on forage scouting, in-season soil sampling/analysis, or plant tissue sampling/analysis.
    - Nutrient application placement below soil surface.
        - Nutrients are injected or incorporated using a minimal soil disturbance method at time of application.
    - Use variable rate technology for all nutrient applications. Variable rate technology may be map-based, sensor-based (crop canopy sensors), or manual. Requires the development of site-specific production maps using soils data, current soil test results, or a productivity monitoring system with GPS to correlate field location with productivity. Data is used to diagnose low, medium, and high productivity areas (pasture management zones).
    - Movement of hay feeding locations to distribute nutrients across the pasture(s) to avoid areas of nutrient concentration and sensitive areas. Develop a detailed hay feed movement plan, which includes soil sampling of the historic/current hay feeding areas and planned areas to assess status of soil nutrients. Monitoring required through annual soil sampling, geo-references photographs, and written records.
    - Adjust pH to the optimum level for legumes and forages. Apply soil amendments to adjust soil pH according to soil test recommendations. Monitoring required through

annual soil sampling. *This option is only applicable on fields with documented need and having existing stands of forage species that do not need re-establishment.*

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide documentation for review by NRCS showing a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- ☐ Prior to implementation, develop and document a planned nutrient budget, forage production goal, and applications (pounds/acre active ingredient, nutrients must include at a minimum N-P-K). *If variable rate technology will be used develop site-specific yield maps and use them to develop management zones within the pasture.*
- ☐ Prior to implementation, develop geo-referenced maps showing location of current areas of livestock concentration.
- ☐ Prior to implementation, select two or more of the nutrient use efficiency strategies or technologies. **Selections:** _____
- ☐ During implementation, keep records to document actual nutrient applications (pounds/acre active ingredient, nutrients must include at a minimum N-P-K).
- ☐ During implementation, minimize soil surface disturbance during fertilizer placement.
- ☐ During implementation, notify NRCS of any planned changes to verify the planned system meets the enhancement criteria.
- ☐ During implementation, additional record keeping requirements for specific strategy or technology:
    - Nutrient application placement below soil surface. Records and documentation must include method of injection or incorporation and depth.

- Variable rate technology. Keep records to document as applied records of actual variable rate applications (maps and/or tabular statistics).
- Monitoring of hay feeding location movement. Maintain annual soil sample results, geo-references photographs, and written records.
- Adjust pH. Maintain soil test results.

☐ After implementation, make documentation and records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Nutrient Management (CPS 590) as it relates to implementing this enhancement.

☐ Prior to implementation, review documentation to verify a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.

☐ Prior to implementation, verify the development of a planned nutrient budget, yield goal, and planned nutrient applications. *If variable rate technology will be used, verify the development of site-specific yield maps used to develop management zones within the field.*

☐ Prior to implementation, verify the selection of two or more nutrient use efficiency strategies or technologies.

☐ During implementation, evaluate any planned changes to verify the planned system meets the enhancement criteria.

☐ After implementation, review documentation and records to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E595A

CONSERVATION STEWARDSHIP PROGRAM

Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Conservation Practice 595: Integrated Pest Management

APPLICABLE LAND USE: Crop (annual & mixed); Crop (perennial)

RESOURCE CONCERN ADDRESSED: Water Quality Degradation

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

Criteria

- Documentation of producer's record of integrated pest management meeting all Conservation Practice Standard Integrated Pest Management (CPS 595) general criteria
- Use of GPS or other geospatial technologies is required to document application and site-specific compliance with all label requirements for controlling non-target application.
- Utilize one or more of the following techniques to reduce the total amount of chemical applied and reduce the potential for delivery of chemicals into water bodies:
    - Precision guidance system which reduces ground or aerial spray overlap to less than 12 inches

- Variable rate technology (VRT) which allows rate of pesticide application to dynamically change for site specific applications
- "Smart sprayer" technology which utilizes automatic sensors and computer controlled nozzles to turn individual nozzles on and off

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide documentation of implementation of integrated pest management meeting all Conservation Practice Standard Integrated Pest Management (CPS 595) general criteria and additional criteria to prevent or mitigate off-site pesticide risks to water quality from leaching, solution runoff, and adsorbed runoff losses.
- ☐ During implementation, keep records of applications using the selected technology with maps and/or tabular data.
- ☐ After implementation, make the following items available for review by NRCS to verify implementation of the enhancement:
  - As applied records of actual applications using the selected technology (maps and/or tabular statistics).

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Integrated Pest Management (CPS 595) as it relates to implementing this enhancement.
- ☐ As needed, provide technical additional assistance to the participant as requested.
- ☐ After implementation, verify implementation of the enhancement, by reviewing records created during enhancement implementation.

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Acres Applied _____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E644A

CONSERVATION STEWARDSHIP PROGRAM

Managing Flood-Irrigated Landscapes for Wildlife

Conservation Practice 644: Wetland Wildlife Habitat Management

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

Criteria

- Develop a conservation plan for the targeted species suite.
- As identified in the conservation plan, flood-irrigation will be applied in an amount and at a time to meet the targeted wildlife need.
- States will apply general criteria from the NRCS National Conservation Practice Standard Wetland Wildlife Habitat Management (Code 644) and additional criteria as required by the NRCS State Office
- Targeted species must be listed on the State Wildlife Action Plan or as State Endangered, State Threatened, State Sensitive (or similar designation).
- Appropriate locations for this enhancement will be provided by the NRCS State Office (NRCS State Office will base locations on current distribution of the targeted species and potential expansion into adjacent habitat for the target species. Other agencies

(e.g. State Department of Fish and Game, USFWS) and organizations (e.g. Ducks Unlimited, The Nature Conservancy) will provide input to NRCS concerning instances where the enhancement is used to provide habitat outside of the current distribution of the target species.)

- Use of fertilizers, pesticides, and other chemicals shall not compromise the intended purpose of this practice.
- Use criteria in other NRCS Conservation Practice Standards to facilitate the management of wetland wildlife habitat as appropriate for the site.
- Depending on site conditions, facilitative practices may be used to implement this enhancement. The NRCS Conservation Practice Standards may include, but are not limited to: Dam, Diversion (Code 348), Diversion (Code 362), Fence (Code 382), Field Border (Code 386), Filter Strip (code 393), Grade Stabilization Structure (Code 410), Irrigation Canal or Lateral (Code 320), Irrigation Field Ditch (Code 388), Irrigation Pipeline (Code 430), Irrigation Storage Reservoir (Code 436), Irrigation System, Surface and Subsurface (Code 443), Irrigation Water Management (Code 449), Nutrient Management (Code 590), Pumping Plant (Code 533), Riparian Herbaceous Cover (Code 390), Shallow Water Development and Management (Code 646), Stream Crossing (code 578), Structure for Water Control (Code 587), and Wetland Enhancement (Code 659).
- A Wildlife Habitat Evaluation Guide (WHEG) specific to wildlife habitat within a flood-irrigated landscape on perennial cropland or pasture must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than or equal to 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Digital photographs documenting the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, provide and explain state NRCS Conservation Practice Standard Wetland Wildlife Habitat Management (Code 644) as it relates to implementing this enhancement.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement; **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant, and discuss range of management alternatives that would improve wildlife habitat conditions
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, review and explain the Wildlife Habitat Management Plan to the participant.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**

☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646A

CONSERVATION STEWARDSHIP PROGRAM

Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

ENHANCEMENT LIFE SPAN: 5 years

Enhancement Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

Criteria:

This enhancement applies to crop land use acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures that affect applicable fields will be closed by mid-fall and remain closed through February 15. For fields where harvest of the crop occurs after mid-fall (e.g., ratoon rice), structures must be closed within 2 days following harvest and remain closed through February 15.
- Applicable fields must be flooded to an average depth of 6 to 18 inches.
  - Water depths of 6 to 10 inches provide maximum benefit to targeted species.
  - Water depths shall not exceed 18 inches for any extended period.

- Manipulation can occur prior to holding water. Manipulation should not affect more than 80 percent of the field to which the activity is applied.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be paired with E647A - Manipulate vegetation on fields with captured rainfall for waterfowl and wading bird winter habitat. If not paired with E647A, this Enhancement may also be paired with E646C – Manipulate vegetation and maintain closed structures for shorebird mid-summer habitat or E646D – Manipulate vegetation and maintain closed structures for shorebird late summer habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure all water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review the results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified, to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened
  - o Digital photographs documenting the condition of the structures and the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify the enhancement will be applied to cropland acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement. **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with the participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using the Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review completed field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646B

CONSERVATION STEWARDSHIP PROGRAM

Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. In addition, flooded conditions promote establishment of aquatic invertebrate populations, a protein-rich food source for shorebirds as well as waterfowl and wading birds. Flooded conditions across the broader landscape promote a network or continuity of habitat that is available to migratory waterfowl and wading birds. Benefits may become greatest during late winter and early spring as birds are assimilating nutrient and fat reserves in preparation for northward migration. However, agricultural fields flooded during fall-winter are typically drained during late January or February in advance of spring planting. This often results in a rapid reduction in available habitat and may constrain ability of migratory birds to adequately prepare for migration, with greatest impacts likely occurring during years of low winter precipitation. Retention of water on agricultural lands into early spring will produce maximum benefits to migratory waterfowl and shorebirds by providing high quality habitat during a time when habitat may otherwise be in low abundance.

Criteria:

This enhancement applies to crop land use acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures affecting the subject land use are to be closed by mid-fall and remain closed until late winter to early spring.
    - Water depths of 6 to 10 inches provide maximum benefit to targeted species.
    - Water depths shall not exceed 18 inches for any extended period.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be grouped with E647A - Manipulate vegetation on fields with captured rainfall for waterfowl and wading bird winter habitat. If not grouped with E647A, this Enhancement may also be grouped with E646C – Manipulate vegetation and maintain closed structures for shorebird mid-summer habitat or E646D – Manipulate vegetation and maintain closed structures for shorebird late summer habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified in order to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain a field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened
  - o Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess the habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement; **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review the results of the wildlife habitat evaluation with the participant, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646C

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Criteria:

This enhancement applies to crop land use acres with leveed fields that are capable of holding 8 to 18 inches of water in early spring, can retain that water until July 31 and will have less than 25 percent woody cover.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures affecting the subject land use acre are to remain closed catching and holding all available precipitation, until mid-summer (i.e. July 31).

- Sites must contain 8 to 18 inches of water.
- Manipulate vegetation on the site, if after late spring to early summer, the site becomes dry with emergent vegetation covering 50 percent or more, at a height of 6 inches or more. Manipulate by rolling or disking to bring the majority (75 percent or more) of the vegetation at or below the soil surface. Rolling is the preferred method of manipulation to maintain soil quality.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

  Note: This Enhancement may be grouped with E646B – Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified in order to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain a field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened;
  - o Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding 8 to 18 inches of water in early spring, can retain that water until July 31 and will have less than 25 percent woody cover.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement; **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using the Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646D

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation and maintain closed structures for shorebird late summer habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Criteria:

This enhancement applies to crop land use acres with leveed fields that are capable of holding 8 to 18 inches of water mid-spring with capabilities for retaining that water until August 31, and will have less than 25 percent woody cover.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures are to remain closed in order to catch and hold all available precipitation until late-summer (i.e., August 31).

- Sites must contain 8 to 18 inches of water.
- Manipulate vegetation on the site, if after June 15, the site becomes dry with emergent vegetation covering 50 percent or more, at a height of 6 inches or more. Manipulation by rolling or disking to bring the majority (75 percent or more) of the vegetation at or below the soil surface. Rolling is the preferred method of manipulation to maintain soil quality.
- The need for vegetative manipulation will be triggered by the above stated scenario. However, multiple manipulations may be needed to achieve the desired habitat response.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be grouped with E646B - Extend retention of captured rainfall for waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain the field log to include:
  - Crops grown and the harvest date for the crops grown on the applicable acres;
  - Date/time the water control structure was closed;
  - Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - Date/time when the water control structures were opened;
  - Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding 8 to 18 inches of water mid-spring with capabilities for retaining that water until August 31, and will have less than 25 percent woody cover.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement; **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop the Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number_____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647A

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

ENHANCEMENT LIFE SPAN: 5 years

Enhancement Description:

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units, especially in the Gulf Coast and Central Valley of California. When flooded to shallow depths during fall and winter, these agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

Criteria:

CONSERVATION STEWARDSHIP PROGRAM

This enhancement applies to crop land use acres with leveed fields that contain robust vegetation (e.g., post-harvest rice stubble, annual grasses and sedges) and are capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the suite of species targeted.
- Manipulation vegetation by either lightly disking or bush hogging or rolling the majority (50-80 percent) of the contracted acres during early to late fall.
    - For fields where harvest of the crop occurs later (e.g., ratoon rice), manipulation must be conducted within 7 days following harvest.
    - Manipulation shall not be done in a large, continuous block. Strip disking and/or mowing in mosaic or other irregular patterns is required.
    - Manipulation can occur prior to or during the water holding period, but manipulation must not affect greater than 80 percent of the field.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be paired with E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat or E646B – Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain a field log to include:
  - Crops grown and the harvest date for the crops grown on the applicable acres;
  - Date/time and description of all habitat management actions taken;
  - Digital photographs documenting the condition of the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop acres with leveed fields that contain robust vegetation (e.g., post-harvest rice stubble, annual grasses and sedges) and are capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647C

CONSERVATION STEWARDSHIP PROGRAM

Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN ADDRESSED: Animal

ENHANCEMENT LIFE SPAN: 5 year

Enhancement Description:

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

Criteria:

This enhancement applies to cropland acres on soils that are hydric and/or significantly water saturated during the growing season and are located on the low side or down slope portion of a field that receives hydrologic surface flow from the remainder of the field. Surface flow could be a result of irrigation or rainfall. Selected areas should be capable of being flooded using a water control structure or other means.

- Develop a habitat management plan targeting waterfowl, shore birds and wading birds for the area enrolled under this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- Maintain naturally occurring vegetation on the appropriate, selected area (minimum 20 feet wide and 500 feet long) to provide forage and cover for waterfowl, shorebirds and wading birds.
- Manipulation (light disking, burning, mowing, or rolling) of the selected area will be allowed during early fall to increase attractiveness and use by targeted species. Otherwise, all mechanical disturbance and chemical treatments shall be excluded from the selected area and care should be taken to ensure that the area is not impacted by agricultural operations in the adjacent crop.
- Control of invasive species may be allowed with approval from local NRCS staff.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review Wildlife Habitat Management Plan.
- ☐ During implementation, follow Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time and description of all habitat management actions taken;
  - o Digital photographs documenting the condition of the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop acres on soils that are hydric and/or significantly water saturated during the growing season and are located on the low side or down slope portion of a field that receives hydrologic surface flow from the remainder of the field. Surface flow could be a result of irrigation or rainfall. Selected areas should be capable of being flooded through the use of a water control structure or other means.
- ☐ Prior to implementation, assess habitat condition using Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions
- ☐ Prior to implementation, develop Wildlife Habitat Management Plan for targeted suite of species
- ☐ Prior to implementation, meet with participant to review Wildlife Habitat Management Plan

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647D

CONSERVATION STEWARDSHIP PROGRAM

Establish and maintain early successional habitat in ditches and bank borders

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 5 year

Enhancement Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

Criteria:

This enhancement applies to crop, pasture, or range land use acres with existing ditches and ditch borders where adequate naturally occurring vegetation is not present.

- Develop a wildlife habitat management plan for the suite of species targeted.
- Allow ditches and bank borders to re-vegetate to naturally occurring vegetation.

- Ditch borders will be a minimum of 20 feet wide and a maximum 60 feet wide.
- In circumstances where woody vegetation exists immediately adjacent to a farm ditch (e.g., such as along a spoil bank), an adjoining minimum 20 feet early successional, native vegetative border will also be established.
- Once established, ditches and borders may not be treated more than once every two years and may not be mowed, disked, grazed, dredged, cleaned, or sprayed with broadcast herbicides, or otherwise disturbed between treatments.
- Encroaching undesired woody vegetation may be controlled between the two treatment periods through spot spraying with approved herbicides.
- For the two approved treatments, light disking, mowing or herbicides may be used to control vegetation next to designated ditches, along ditch banks and borders.
    - These treatments must be applied outside of the primary wildlife ground nesting season.
    - Only herbicides approved for appropriate site conditions shall be applied.
    - Herbicides shall be applied following manufacturers label requirements.
- Grazing is not permitted unless a grazing management plan is in effect.
- Multiple ditch borders on the same property must have varying maintenance schedules.
- Invasive species such as kudzu, cogongrass, Chinese tallow tree, etc. that may become established in the border area must be controlled by spot spraying with an approved herbicide.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland, must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Type of crop(s) grown.
  - o Harvest date of crops grown on the applicable acres.
  - o Date/time and description of all habitat management actions taken.
  - o Digital photographs documenting the condition of the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop, pasture, or range acres with existing ditches and ditch borders where adequate naturally occurring vegetation is not present.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with the participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with the participant to review the Wildlife Habitat Management Plan.

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- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E666A

Maintaining and improving forest soil quality.

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Soil, Air

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

Criteria

- States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.
- Update or modify the Forest Management Plan to include the following guidelines for forest soil quality management, as appropriate for the site.
    - Limit the area of compacted soils
        - Operate equipment on established roads and trails and minimize travel into the general forest area
        - Operate equipment on woody debris (slash) in areas with sensitive or wet soils
        - Sequence forest management activities (back to front) to limit the number of equipment passes

- Use smaller and lighter equipment, track equipment, low PSI tires, and lighter loads. Where appropriate, use mules, draft horses or other animals for moving harvested trees
- Restore heavily compacted areas (e.g., by sub-soiling or other mechanical method)

o Limit impacts of roads and landings

- Avoid disturbing natural drainage channels (e.g., design road locations to minimize stream crossings and diversions)
- Roads and landings occupy 5% or less of total wooded acreage
- Establish cover on roads and landings that are not in use

o Limit soil disturbance and control erosion

- Avoid disturbing forest litter and the soil surface
- Protect roads using water bars/rolling dips
- Establish cover on disturbed areas
- Retain downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention

o Maintain favorable conditions for forest growth

- Control the amount of road use, and off-road travel, to prevent erosion, compaction, and disturbance of the soil surface
- Establish cover on any disturbed areas
- Monitor the forest area for signs of insect damage, tree diseases, invasive plants, or other impacts on forest growth and health

o Retain and enhance carbon storage to support soil ecologic functions

- Follow stocking guidelines to maintain tree canopy cover (i.e., between the A and B lines of stocking guides at a minimum; preferably closer to the A line). See the stocking chart shown below.
- Add woody material to the soil by girdling or cutting non-merchantable trees or trees of undesired species
- Use extended rotations to keep carbon on the site for a longer period

CONSERVATION STEWARDSHIP PROGRAM

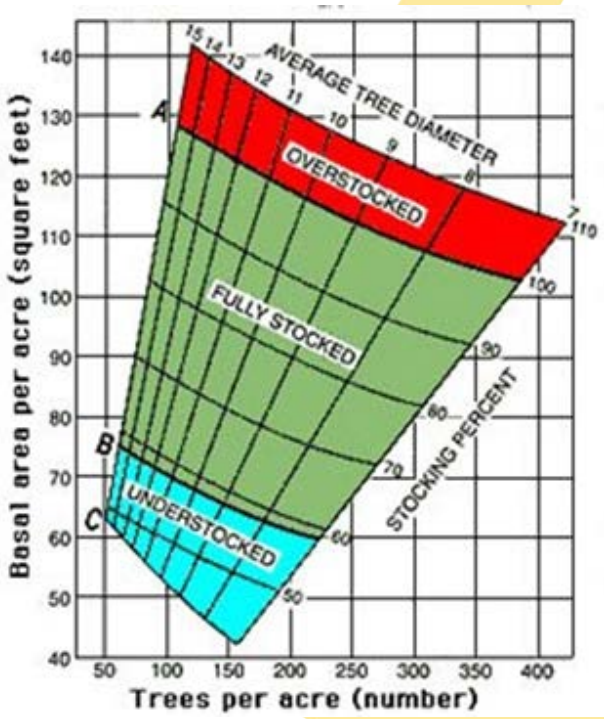
- Retain fallen trees, branches, snags, downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention, in quantities as specified below, or by the NRCS State Office.
  - For western conifer forests, maintain coarse woody residue:
    - that is greater than 3" in diameter,
    - left lying on the soil surface, and
    - which meets the post-harvest target levels of the following chart:

	Habitat Type	Target tons per acre of coarse woody debris
Dry Forests	Ponderosa pine types	5-13 tons/acre
⇕	Douglas-fir types	7-14 tons/acre
	Grand fir types	7-14 tons/acre
Moist Forests	Western hemlock types	16-33 tons/acre

- Maintain soil productivity by soil testing and fertilization if needed (including options for fertilizing with manure, biochar, or other organic materials).
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/ stocking guides.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.

- Refer to WIN-PST criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) and comply with applicable State and local laws if an herbicide will be used.
- Time tree girdling or felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) to protect soil and site resources from vehicle impacts. Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.

Figure 1: Stocking Chart *showing tree size and density scales indicating when forests are overstocked (too crowded), fully stocked (providing good growth), and understocked (trees do not fully utilize the site). Stocking guides were developed by Gingrich (1967).*



CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- ☐ Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard or appropriate state Job Sheet and use this information to meet the criteria of this enhancement.

- ☐ Prior to implementation, have a current or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for rehabilitating existing soil resource damage including compaction, ruts, puddling, erosion, downslope soil movement, exposed mineral soil, and depletion of the forest floor. It will also address rehabilitation for any water resource concerns such as diverted streams or intermittent flows. It will assess road layout and provide guidance on practices to correct any erosion or hydrologic impacts. Have the FMP available for NRCS review.

- ☐ Prior to implementation, arrange for soil tests to be conducted, one per each five acres. The FMP will include guidance for correcting any significant nutrient deficiencies.

- ☐ Prior to implementation, arrange for a forestry specialist to evaluate the stand and perform site-specific marking of areas to be seeded with cover plantings, locations where water control is needed, and trees that are to be girdled for snag creation.

- ☐ Prior to implementation, be aware of the state's Forestry Best Management Practices (BMP's) so they can be followed to protect the site and maintain soil and water quality.

- ☐ Prior to implementation, be aware of the current stocking level of trees on the site and the target level of stocking to maintain as part of this enhancement. This information should be detailed in the Forest Management Plan.

- ☐ During implementation, maintain the stand in a fully stocked condition using the appropriate stocking chart, between the A and B lines (see figure 1). The target stocking level should be between the A and B line, but closer to the A line.

- ☐ During implementation, follow state BMP guidelines and any additional guidance from the NRCS State Office to protect trails, roads and landings from soil loss or damage. Re-vegetate these disturbed areas or close them off to traffic to allow natural vegetation to grow on these areas.

- ☐ During implementation, spread tops and limbs across the site during any tree reduction operations to protect the soil.
- ☐ After implementation, provide the following information to NRCS; dates completed, methods used, representative post-treatment photos, and a map delineating the treated acres.

NRCS will:

- ☐ Prior to implementation, aid with interpretation of a current or updated FMP on acres targeted by this enhancement.
  - o Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - o Forest Stand Improvement (Code 666)
  - o Integrated Pest Management (Code 595)
  - o Forest Trails and Landings (Code 655)
  - o Access Road (Code 560)
- ☐ As needed, prior to implementation, NRCS will provide technical assistance in:
    - o Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and will discuss the details with the participant.
- ☐ Prior to implementation, discuss the requirement to follow the state's Forestry Best Management Practices (BMPs).
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666D

CONSERVATION STEWARDSHIP PROGRAM

Forest management to enhance understory vegetation

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants, Animals, Water

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages the structure and composition of overstory and understory vegetation to:

- Reduce vulnerability to damage by insects and diseases of forest trees. Canopy gaps and open understory allow for air circulation that reduces the incidence of disease, and the improved health of the residual trees increases their ability to withstand insect attacks
- Managing the understory vegetation will also reduce the risk of wildfire and promote development of herbaceous plants that benefit wildlife.
- Capture additional moisture and filters the water through the vegetation and soil.
- Managing the understory vegetation will increase available water to plants, minimize run-off and erosion, improve water quality, and limit nutrient entry into ground water.
- Reducing the number of trees per acre provides canopy openings that allow sunlight to reach the forest floor and promote the growth of herbaceous plants, improving wildlife shelter and cover in the forest understory.

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

Criteria:

CONSERVATION STEWARDSHIP PROGRAM

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.
- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), and Herbaceous Weed Control (Code315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard.

CONSERVATION STEWARDSHIP PROGRAM

Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

- The acres planned must have an "acceptable growing stock" level of at least the B line on an appropriate stocking chart.
- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
  a. Excessive volatile live vegetation and woody debris –When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
  b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
  c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required provided the fuel continuity is disrupted.
  d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- ☐ Prior to implementation, develop an understanding of management practices that reduce a dense understory of small trees and brush, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- ☐ Prior to implementation, work with a professional forester to prepare or update a current Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for thinning the stand and maintaining fully stocked conditions as specified in enhancement criteria. Depending on the resource concern addressing the FMP will also include recommended practices for managing understory vegetation to:
  - o Minimize risks of insect and disease outbreaks.
  - o Include recommended practices for managing understory vegetation to favor moisture infiltration.
  - o The FMP will also include recommended practices for managing understory vegetation to favor wildlife cover and shelter.
  - o Include recommended practices for managing understory vegetation to capture nutrients.
- ☐ Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - o Brush Management (Code 314)
  - o Forest Trails and Landings (Code 655)
  - o Herbaceous Weed Control (Code 315)
  - o Integrated Pest Management (Code 595)
  - o Woody Residue Treatment (Code 384)
  - o Prescribed Burning (Code 338)
- ☐ Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- ☐ Prior to implementation, work with a professional forester who will mark trees and groups of trees to be removed or killed, and who will develop a strategy for controlling undesirable understory vegetation.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- ☐ During implementation, follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and specifications provided by NRCS, to ensure that:
  - o Trees are removed, killed, or retained to achieve all planned purposes and landowner objectives.
  - o The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
  - o The operation avoids or minimizes damage to desirable vegetation.
- ☐ During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- ☐ During implementation, reduce stand stocking to correspond with the B-line of an appropriate stocking chart, retaining trees with larger, healthy crowns and undamaged trunks. If tree removal is not an option, reduce density by killing selected trees through girdling and/or chemically treatments.
- ☐ During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions. If prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a state approved prescribed burn plan. If using chemical methods, follow application and timing recommendations from an approved source.
- ☐ During implementation, limit the size of debris piles to minimize wildfire hazards.
- ☐ During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, take digital photos showing representative post-treatment conditions.
- ☐ After implementation, notify NRCS that the work has been completed and make treatment documentation records available for NRCS review and certification.

NRCS will:

- ☐ Prior to implementation, assist with interpretation of a current or updated FMP for sites where this enhancement will be applied.
- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- o Brush Management (Code 314)
- o Herbaceous Weed Control (Code 315)
- o Forest Stand Improvement (Code 666)
- o Woody Residue Treatment (Code 384)
- o Forest Trails and Landings (Code 655)
- o Integrated Pest Management (Code 595)
- o Prescribed Burning (Code 338)

- ☐ Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ After implementation, review treatment documentation records and certify that the enhancement was completed according to specifications in this enhancement, and in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666E

CONSERVATION STEWARDSHIP PROGRAM

Reduce height of the forest understory to limit wildfire risk

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.

CONSERVATION STEWARDSHIP PROGRAM

- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).
- The acres planned must have an “acceptable growing stock” level of at least the B line on an appropriate stocking chart.

CONSERVATION STEWARDSHIP PROGRAM

- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
  a. Excessive volatile live vegetation and woody debris – When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
  b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
  c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required as long as the continuity is disrupted.
  d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, work with a professional forester to develop or update a forestry management plan for the property.

☐ Prior to implementation, work with a professional forester to include **current** species, cover type, and size class distribution for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **desired** species, cover type, and size class distribution for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include in the updated or developed plan to identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, work with a professional forester using available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, work with professional forester and NRCS to delineate on a map the treatment areas and dates.

☐ Prior to implementation, discuss with professional forester or NRCS if NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) will be necessary for access or to reduce erosion from vehicles/equipment.

☐ Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris.

☐ Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Prescribed Burning (Code 338) to appropriately treat slash and debris.

☐ During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

☐ During implementation, keep evidence to support the treatment activities were completed using representative photos. Location of representative photos must be indicated on the map delineating treated areas.

☐ After implementation, notify NRCS that treatment has been completed and submit pictures and map to support this.

NRCS will:

☐ Prior to implementation, provide and discuss with participant, as needed, NRCS Conservation Practice Standards Forest Trails and Landings (Code 655), Woody Residue Treatment (Code 384), and Prescribed Burning (Code 338).

☐ Prior to Implementation, verify that participant plan has been developed or updated by a professional forester.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** species, cover type, and size class distribution for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and identifies and retains preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and uses available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

CONSERVATION STEWARDSHIP PROGRAM

☐ Prior to implementation, assist the landowner, as needed, to delineate on a map the treatment areas and dates of treatment.

☐ During Implementation, verify any planned changes in plan will meet the enhancement criteria.

☐ After Implementation, verify that the treatment has been completed and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666G

CONSERVATION STEWARDSHIP PROGRAM

Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 YEARS

Enhancement Description:

Opening the tree canopy along roads ("daylighting") and providing space between ground vegetation and tree crowns minimizes the spread of wildfires that often start along roads and improves wildlife habitat and food sources for many species. Some trees near a forest road are removed through harvesting, cutting, mulching, or another option available at the site, with the objective of creating a partially open forest canopy bordering the road. A semi-open canopy allows more sunlight to reach the forest floor to promote herbaceous understory plants and reduces maintenance needs by allowing moisture to evaporate from roads. The reduced canopy and herbaceous understory limit woodland fuel buildup and reduce fire intensity.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard (CPS) Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Apply the enhancement to sites where vegetation on roadsides presents a fire risk, is inadequate for wildlife habitat, or is detrimental to road maintenance. Treat a strip of forest on both sides of the road, as needed and if feasible. Implement the enhancement for a distance of at least 35 feet into the forest stand from the edge of the road, and extend the distance as needed up to 100 feet based on slope, aspect, soils, fuel type, etc. Use criteria in NRCS CPS Fuel Break (Code 383).

- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation

CONSERVATION ENHANCEMENT ACTIVITY

E666G

CONSERVATION STEWARDSHIP PROGRAM

Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.

CONSERVATION STEWARDSHIP PROGRAM

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.
- Wetland compliance and highly erodible land regulations must be followed.
- Trees removed as part of the treatment process that have marketable quality may be sold. Retain desirable species with large healthy crowns, and trees and shrubs that provide a diversity of wildlife food sources. Remove trees that are:
    - At high risk of mortality or failure (unless retained as a wildlife tree at a safe distance from the road)
    - Of low crown vigor
    - Of poor stem form and quality
    - Less-desirable species.
- Trees that cannot be sold may be removed by cutting, mulching, firewood distribution, or other means to reduce the canopy and allow sunlight to reach the forest floor. Trees further away from the road may be killed and left standing as snags, if they will not fall onto the road.
- Minimize damage to residual trees during the daylighting process.
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) Brush Management (Code 314), or Herbaceous Weed Control (Code 315) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384), to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

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- The understory vegetation can be maintained by prescribed burning where appropriate. Use NRCS CPS Prescribed Burning (Code 338). If prescribed burning is not an option, alternative methods may be used to manage the understory vegetation, such as mowing or fall disking.

- The daylighted area may be treated with herbicides to control noxious and invasive plants and undesirable woody vegetation to promote herbaceous plants. Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (Code 315)

- No daylighting activities should take place during the nesting season for ground nesting birds.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- Prior to implementation, develop an understanding of management practices that reduce tree density, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - Brush Management (Code 314)
  - Herbaceous Weed Control (Code 315)
  - Integrated Pest Management (Code 595)
  - Woody Residue Treatment (Code 384)
  - Prescribed Burning (Code 338)
- Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- Prior to implementation, work with a professional forester who will mark trees and groups of trees to remove and will develop a strategy for controlling undesirable understory vegetation.
- Prior to implementation, if prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a prescribed burn plan. If chemical methods will be used, obtain recommendations from an approved source.
- Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- During implementation, follow criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) and specifications provided by NRCS, to ensure that:
  - Overstory trees are removed or retained to achieve all planned purposes and landowner objectives.
  - The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
  - The operation avoids or minimizes damage to desirable vegetation.

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- During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- During implementation, treat a strip of forest on both sides of the road, if needed and feasible. Implement the enhancement for a distance of at least 35 feet into the forest stand from the edge of the road, and extend the distance as needed up to 100 feet from the road based on slope, aspect, soils, fuel type, etc.
- During implementation, focus on retaining healthy trees and when available retain trees that provide wildlife benefits such as oaks, hickories, etc.
- During implementation, remove trees that are at risk of mortality, trees with low crown vigor, trees with poor form and quality, and less-desirable species.
- During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions.
- During implementation, limit the size of debris piles to minimize wildfire hazards.
- During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- After implementation, take digital photos showing representative post-treatment conditions.
- After implementation, notify NRCS that the work has been completed and make treatment documentation available for NRCS review and certification.

NRCS will:

- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - Fuel Break (Code 383)
  - Brush Management (Code 314)
  - Herbaceous Weed Control (Code 315)
  - Forest Stand Improvement (Code 666)
  - Woody Residue Treatment (Code 384)
  - Forest Trails and Landings (Code 655)
  - Integrated Pest Management (Code 595)
  - Prescribed Burning (Code 338)
- As needed, prior to implementation, NRCS will provide technical assistance in:

CONSERVATION STEWARDSHIP PROGRAM

- Interpreting enhancement criteria relative to tree species to retain and remove or kill, and strategy for controlling undesirable understory vegetation.
- Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- Prior to implementation, ensure that the participant has an appropriate prescribed burn plan, herbicide recommendations from an approved source and an understanding of how these practices will be applied on the property.
- Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- During implementation, provide technical assistance if requested by the participant.
- After implementation, review documentation and photographs to verify the enhancement was completed according to specifications in this enhancement and NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666H

CONSERVATION STEWARDSHIP PROGRAM

Increase on-site carbon storage

CONSERVATION PRACTICE: 666 - Forest Stand Improvement

APPLICABLE LAND USE: Forest; Associated Ag Land; Farmstead

RESOURCE CONCERN: Soil, Air

ENHANCEMENT LIFE SPAN: 10 years

Enhancement Description

Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic matter.

Criteria

- Apply all of the following activities:
  - Retain all snags and downed woody debris of 6" diameter or larger at the base.
  - Identify leave-trees or clumps of trees that will be retained on site throughout their life span. These would ideally be trees that also provide wildlife habitat (e.g., future cavity/den trees, species that develop loose bark at older ages, mast producers, etc.).
  - Close unneeded roads and limit off-road vehicular traffic to avoid displacing the forest litter layer.

- Apply at least one activity from among the following as appropriate for the site:
  - Transition from even-aged to uneven-aged management.
  - Use regeneration methods (e.g., group selection, shelterwood, seed-tree, expanding gap) that call for retention of mature trees during the period when advanced regeneration develops.
  - Adopt techniques for maintaining and/or improving soil quality, specifically retention or organic carbon.
  - Maintain canopy cover to shade the forest floor and avoid hastening decomposition.

- During forest management activities, apply the following criteria:
    - Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
    - Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to maintain the stand, as much as possible, consistent with chosen regeneration method, in a fully stocked condition based on appropriate stocking guide.
    - Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
    - Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Refer to Conservation Practice Standard Forest Trails and Landings (Code 655) and Road/Trail/Landing Closure and Treatment (Code 654).
    - The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation:

- develop a new or updated forest management plan (FMP) that may reflect a change in management objectives.
- review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) that contains information needed to meet criteria for this enhancement.
- develop an understanding of the management that this is required to increase carbon storage appropriate for the resource setting to include the following activities:
    - implement forest management activities that begin a transition from even-aged to uneven-aged management.
    - retain dead wood and select trees or clumps of trees that are intended to be left on the site throughout their life span.
    - use regeneration methods (e.g., group selection, shelterwood, seed-tree, expanding gap) that require retention of mature trees during the period when advanced regeneration develops.
    - adopt techniques for maintaining and/or improving soil quality, specifically retention of organic carbon.

  - maintain canopy cover to shade the forest floor and avoid hastening decomposition.
- For forest lands, work with professional forester to prepare or update a current FMP that includes activities required to implement this enhancement. NRCS State Office will determine if a FMP will be required for Associated Ag Land or Farmstead settings. (Request NRCS technical assistance, as needed.)
- Arrange to have a professional forester or wildlife specialist, as part of developing or updating an FMP:
  - identify and map areas, selected trees, or groups of leave trees that can serve as wildlife habitat and that are intended to be left on site throughout their lifespan.
  - describe amounts and condition of standing snags and fallen woody debris with 6" or larger basal diameter.
  - identify and map trails or roads that can be planned for closure.
- Recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - Forest Trails and Landings (Code 655)
  - Road/Trial/Landing Closure and Treatment (Code 654)
  - Woody Residue Treatment (Code 384)
- Acquire all necessary approvals and permits (i.e., local, state, or federal, as applicable).

☐ During implementation:

- Follow FMP guidelines follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- Follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and in specifications provided by NRCS, to ensure that:
  - overstory tree and understory species are retained to achieve all planned purposes and landowner objectives.
  - establish required spacing, density, size-class distribution, number of trees, and amount of understory species to be retained.
  - schedule treatments to maintain the stand, as much as possible, consistent with the chosen forest regeneration method, in a fully stocked condition based on appropriate stocking guide.
  - avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- Evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria, as needed.

☐ After implementation:

- Ensure that retained leave areas are properly protected.
- Update the FMP to documentation treatment acres, completion dates and methods, and document representative treatments with digital photos.

- Notify NRCS that the work has been completed and make treatment documentation available for NRCS review and certification.

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NRCS will:

☐ Prior to implementation:

- Provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
  - Forest Stand Improvement (Code 666)
  - Woody Residue Treatment (Code 384)
- Provide technical assistance in, as needed:
  - Guiding the proper sequence and timing of planned FMP treatment activities to meet requirements to maintain and increase on-site carbon storage.
  - Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- Ensure that the participant has a current and complete FMP describing all treatment activities for the resource setting.

☐ During implementation:

- Provide technical assistance if requested by the participant.
- Evaluate any planned changes to verify they meet the enhancement criteria.

☐ After Implementation:

- Verify the enhancement was implemented according to the NRCS Conservation Practice Standard Forest Stand Improvement Standard (Code 666) specifications and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666I

CONSERVATION STEWARDSHIP PROGRAM

Crop tree management for mast production

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land, Farmstead

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Forest stand improvement using crop tree management techniques to increase mast production.

Criteria

- States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.
- Identify the number of mast crop trees to be developed based on site productivity and spacing guidelines for the mast tree species. See State guidelines.
- Crop tree crowns should be in the upper level of the forest canopy (dominant and/or codominant trees), and not suppressed by other tree crowns.
- Cut or kill all trees whose crowns touch the crown of the crop tree on four sides (three sides if adjacent to another crop tree), and leave additional space for large crown development of mast crop trees. Crop trees will have >15 feet of space on all treated sides.
- Retain a diversity of tree species to reduce the potential impact of an epidemic event (e.g. insect outbreak) that may kill some/all trees.

- Trees that are below the crown of the crop tree or are not affecting crown development will be left to provide protection from wind damage, limit epicormic sprouting, and provide diversity for wildlife habitat.
- Trees removed that have marketable quality can be sold.
- All killed trees shall be left standing to provide wildlife habitat, except where snags will become a safety hazard (within 100 feet of a building, power line, road, etc.) or create a fire hazard. Snags that must be cut for safety reasons shall be left on site to become coarse woody debris on the forest floor (unless they create a fire hazard).
- As applicable, additional actions include:
    - Cutting damaging vines away from crop trees
    - Treatment of invasive plants that may be stressing crop trees
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or

when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, identify the number of dominant and/or codominant mast producing crop trees to be developed based on site productivity and spacing guidance for mast trees, as required in state specific guidelines. (NRCS will provide technical assistance, as needed.)
- ☐ During implementation, release all crop trees on all sides by killing competing trees within 15 feet of the crop tree's crown/canopy.
- ☐ During implementation, retain a diversity of tree species, cut damaging vines away from crop trees, and treat invasive plants that may stress crop trees.
- ☐ During implementation, leave all killed trees (unless removed as a merchantable product) standing to provide additional wildlife habitat, except where snags could become a safety hazard. Trees that must be cut for safety reasons will be left on site to become coarse woody debris on the forest floor.
- ☐ During implementation, protect the site from plant and animal pests, fire, and adverse impacts to the soil resource.

NRCS will:

- ☐ Prior to implementation, as needed, provide technical assistance in determining sites for enhancement implementation that meet specified criteria, including the number of crop trees per acre needed and the spacing of those trees.
- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement (as applicable for the site):
    - o Forest Stand Improvement (Code 666)
    - o Integrated Pest Management (Code 595)
    - o Forest Trails and Landings (Code 655)
    - o Access Road (Code 560)
    - o Woody Residue Treatment (Code 384)
    - o Prescribed Burning (Code 338)

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- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, document the number of crop trees per acre and average spacing and verify the post treatment stand conditions meet the specifications developed for the crop tree release activity.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666J

CONSERVATION STEWARDSHIP PROGRAM

Facilitating oak forest regeneration

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land

RESOURCE CONCERN: Plants, Animals

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (e.g., a regeneration cut). After a regeneration cut, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of oak seedlings and saplings. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Develop or update a forest management plan (FMP) in consultation with NRCS personnel and a professional forester to direct the management of the property. The FMP will include guidelines for the amount of advanced oak regeneration needed to achieve the desired future condition. It will describe the types of competition or other stressors that threaten oak survival and recruitment in the area, and recommend facilitating controls such as prescribed burning, chemical, and mechanical treatments to achieve desired outcomes. The FMP will also include guidelines for future inspection and monitoring, types of forest health impacts or stand damage to look for during inspections, and potential supplementary activities that may be needed to achieve additional oak recruitment and regeneration.

This enhancement may be applied only to forest stands that have already had a seed tree, shelterwood, thinning, or other silvicultural treatment designed to regenerate oak. The stands must contain an adequate amount of oak regeneration in the seedling and/or sapling stages, sufficient to achieve stand objectives if they survive and become fully established. The stands must also have evidence that the oak regeneration is not "free to grow" due to the presence of competing species. This enhancement is not appropriate for stands that have reached the pole timber size class because they are considered fully established at that point and stand management activities will be different.

- A forestry specialist will inspect the stand and identify existing or potential species of harmful insects, tree diseases, and invasive plants, as well as other biotic and abiotic (i.e. ice storms, drought, flooding, etc.) impacts on forest growth, health, structure and/or composition.

- A forestry specialist will conduct regeneration surveys according to methods described in the NRCS National Forestry Handbook, Title 190, Section 636.2.

- The forestry specialist will make recommendations for short-term treatments as needed. A skilled laborer will implement appropriate activities such as applying mechanical and spot chemical treatments, and/or installing tree protection.

- In appropriate settings, prescribed burning may be used to control vegetative competition after oak root systems are sufficiently established to re-sprout after a fire. With the recommendation of a forestry specialist, use NRCS Conservation Practice Standard Prescribed Burning (Code 338), or CSP Enhancement E338B, Short-interval burn.

- The forestry specialist will recommend additional practices as needed to correct undesirable forest health conditions. Practices may include: NRCS Conservation Practice Standards Integrated Pest Management (Code 595), Brush Management (Code 314), Herbaceous Weed Control (Code 315).

- Forest stands lacking sufficient oak regeneration with no surrounding seed-producing oaks may need an enrichment planting of oak. Use NRCS Conservation Practice

Standard Tree and Shrub Establishment (Code 612). Prescribed burning may not be appropriate where trees have been recently planted.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, the participant will obtain a new or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will identify regeneration needs, competition that impedes oak regeneration and recruitment, other forest health concerns, and activities recommended for implementation. The participant will make the FMP available for NRCS review.
- Prior to implementation, arrange for a forestry specialist to inspect the stand and perform the tasks identified in this enhancement.
- Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard and other applicable implementation documentation and use the information to meet the criteria of this enhancement.
- During implementation, the participant and the forestry specialist will ensure that regenerating oak trees are protected from any damage.
- During implementation, notify NRCS if there are any planned changes, to verify they meet the enhancement criteria.
- After implementation, notify NRCS that the work has been completed, and make the following information available to NRCS: dates that inspection was conducted, methods used, and the treatments applied to remove competition and protect young oaks.

NRCS will:

- Prior to implementation, verify the enhancement activity is planned for acres that meet the criteria within the enhancement guide sheet. Verify that a forest stand improvement treatment to initiate oak regeneration was previously applied, that regenerating seedling and/or sapling oaks are present, and that oak survival is threatened by competing species and/or other environmental stressors.
- Prior to implementation, provide assistance with interpretation of a new or updated FMP on acres targeted by this enhancement.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
    - Forest Stand Improvement (Code 666)

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- Integrated Pest Management (Code 595)
- Prescribed Burning (Code 338)
- Brush Management (Code 314)
- Herbaceous Weed Control (Code 315)
- Tree/Shrub Establishment (Code 612)
- Tree/Shrub Site Preparation (Code 490)

☐ As needed, prior to implementation, NRCS will provide technical assistance by:

- Preparing specifications for applying this enhancement for each site using approved guide sheets, implementation requirements, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and discussing the details with the participant.
- Providing methods for conducting regeneration surveys.

☐ During implementation, provide technical assistance if requested by the participant.

☐ During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.

☐ After implementation, certify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666L

CONSERVATION STEWARDSHIP PROGRAM

Forest Stand Improvement to rehabilitate degraded hardwood stands

Conservation Practice 666: FOREST STAND IMPROVEMENT

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.). Some crop tree species will meet multiple objectives (oak, cherry, black walnut, tulip-poplar, pine, spruce).
- Crop trees will receive a crown-touching release: any undesirable trees touching a crop tree crown will be cut or killed.

- Areas of 0.25 acre or more with no crop trees will be clear-cut, up to 3 acres in size.
- Forest stand improvement activities will be planned and applied in a manner to meet the habitat requirements for wildlife species of concern as determined by the state's NRCS Wildlife Habitation Evaluation Guide (WHEG) and will be managed to achieve or maintain a value of 0.75 or greater.
- Invasive species will be controlled before tree cutting begins.
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Treatment activities will be conducted during periods of the year that accommodate reproduction and other life-cycle requirements of the targeted wildlife and pollinator species.
- Retain a diversity of tree species, where possible, to reduce the potential impact of an epidemic event (e.g. insect outbreak) that may kill trees of some species.
- Trees removed that have marketable quality can be sold.
- Killed trees that do not interfere with tree regeneration shall be left standing to provide wildlife habitat, except where snags will become a safety hazard (within 100 ft. of a building, power line, road, etc.) or create a fire hazard. Snags that must be cut for safety reasons shall be left on site to become coarse woody debris on the forest floor (unless they create a fire hazard).
- As applicable, cut damaging vines away from crop trees
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.

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- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (code 338).
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- ☐ Prior to implementation, work with professional forester to develop forest management plan documenting which of the three methods will be used (crop tree release, group selection, or clear cut) and in what stands they will be implemented.
- ☐ Prior to implementation, work with professional forester and/or NRCS to determine ways to implement the enhancement that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- ☐ Prior to implementation, work with professional forester and/or NRCS to protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation.
- ☐ Prior to implementation, work with professional forester and/or NRCS if temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- ☐ Prior to implementation, work with professional forester and/or NRCS to delineate areas to be treated on a map (s).
- ☐ Prior to implementation, work with professional forester and/or NRCS to complete an Implementation Requirements sheet for NRCS Conservation Practice Standard Forest Stand Improvement (Code 666). Depending on method(s) specified in the plan, address:
    - o Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.).
    - o Identify areas of 0.25 to 1 acre in size that will have group selection.
    - o Identify areas of 1-3 acres in size that will be clear cut.
    - o Specify how undesirable trees and shrubs will be cut or killed.

Stand #	Treatment Option

- ☐ Invasive species will be treated prior to implementation or concurrently with cut.

- ☐ During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.
- ☐ During implementation, verify that killed trees/snags that do not interfere with regeneration are left standing or cut and left on site (if safety hazard).
- ☐ During implementation, cut damaging vines away from crop trees.
- ☐ After implementation, notify NRCS that implementation has been completed.

NRCS will:

- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - o Integrated Pest Management (Code 595)
  - o Woody Residue Treatment (Code 384)
  - o Prescribed Burning (Code 338)
  - o Access Road (Code 560)

- ☐ Prior to Implementation, provide and explain, as needed, NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) and assist the participant in completing an Implementation Requirements sheet. Depending on method(s) specified in the plan address:
  - o Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.).
  - o Identify areas of 0.25 to 1 acre in size that will have group selection.
  - o Identify areas of 1-3 acres in size that will be clear cut.
- ☐ Prior to implementation, assist landowner to determine ways to implement the enhancement that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- ☐ Prior to implementation, assist landowner to protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. Provide and document with Participant on NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) Implementation requirements sheet.
- ☐ Prior to implementation, if temporary access is needed, provide participant with NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, as needed, provide assistance in delineating treatment area on a map(s).
- ☐ Prior to implementation, verify that invasive species have been treated or treating concurrently with cut.
- ☐ Prior to implementation, Wildlife Habitat Evaluation Guide (WHEG) or State equivalent must be completed. **Existing condition WHEG score:_____ Planned after implementation WHEG score:_____**
- ☐ During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify that killed trees/snags that do not interfere with regeneration are left standing or cut and left on site (if safety hazard).
- ☐ After implementation verify that damaging trees have been removed from crop trees.
- ☐ After implementation, Wildlife Habitat Evaluation Guide (WHEG) or State equivalent must be completed and have a value of 0.75 or greater. **After implementation WHEG score:_____**
- ☐ After Implementation, verify the enhancement was implemented according to the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) specifications and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666S

CONSERVATION STEWARDSHIP PROGRAM

Facilitating longleaf pine regeneration and establishment

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land

RESOURCE CONCERN: Plants, Animals

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Facilitate longleaf pine regeneration and establishment following a forest stand improvement treatment for natural regeneration (e.g., a regeneration cut), or where longleaf has been previously planted. After a regeneration cut or a planting, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of longleaf pine. This enhancement will release seedling and sapling longleaf from competing invasive plants and other undesirable species. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in longleaf pine regeneration and establishment by providing for follow-up activities that require the expertise of a professional forester.

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Develop or update a forest management plan (FMP) in consultation with NRCS personnel and a professional forester to direct the management of the property. The FMP will include guidelines for the amount of advanced longleaf pine regeneration needed to achieve the desired future condition. It will describe the types of competition or other stressors that threaten longleaf survival and recruitment in the area, and recommend facilitating controls such as prescribed burning, chemical, and mechanical treatments to achieve desired outcomes. The FMP will also include guidelines for future inspection and monitoring, types of forest health impacts or stand damage to look for during inspections, and potential supplementary activities that may be needed to achieve longleaf establishment and recruitment.

- stands that have already had a seed tree, shelterwood, thinning, or other silvicultural treatment designed to regenerate longleaf pine. The stands must contain an adequate amount of longleaf regeneration or planted trees in the seedling and/or sapling stages, sufficient to achieve stand objectives if they survive and become fully established. The stands must also have evidence that the longleaf regeneration is not "free to grow" due to the presence of competing species. This enhancement is not appropriate for stands that have reached the pole timber size class because they are considered fully established at that point and stand management activities will be different.

- A forestry specialist will inspect the stand and identify existing or potential species of harmful insects, tree diseases, and invasive plants, as well as other biotic and abiotic (i.e. ice storms, drought, flooding, etc.) impacts on forest growth, health, structure and/or composition.

- A forestry specialist will conduct regeneration surveys according to methods described in the NRCS National Forestry Handbook, Title 190, Section 636.2.

- The forestry specialist will make recommendations for short-term treatments as needed. A skilled laborer will implement appropriate activities such as applying mechanical and spot chemical treatments.

- In appropriate settings, prescribed burning may be used to control vegetative competition after longleaf root systems are sufficiently established to re-sprout after a fire. With the recommendation of a forestry specialist, use NRCS Conservation Practice Standard Prescribed Burning (Code 338), or CSP Enhancement E338B, Short-interval burn.

- The forestry specialist will recommend additional practices as needed to correct undesirable forest health conditions. Practices may include: NRCS Conservation Practice Standards Integrated Pest Management (Code 595), Brush Management (Code 314), Herbaceous Weed Control (Code 315), etc..

- Forest stands lacking sufficient longleaf regeneration may need an enrichment planting of longleaf. Use NRCS Conservation Practice Standard Tree and Shrub Establishment (Code 612). Prescribed burning may not be appropriate where trees

- have been recently planted.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, the participant will obtain a new or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will identify regeneration needs, competition that impedes longleaf regeneration and recruitment, other forest health concerns, and activities recommended for implementation. The participant will make the FMP available for NRCS review.
- Prior to implementation, arrange for a forestry specialist to inspect the stand and perform the tasks identified in this enhancement.
- Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard and other applicable implementation documentation and use the information to meet the criteria of this enhancement.
- During implementation, the participant and the forestry specialist will ensure that regenerating longleaf trees are protected from any damage.
- During implementation, notify NRCS if there are any planned changes, to verify they meet the enhancement criteria.
- After implementation, notify NRCS that the work has been completed and make the following information available to NRCS: dates that inspection was conducted, methods used, and the treatments applied to remove competition and protect young longleafs.

NRCS will:

- Prior to implementation, verify the enhancement activity is planned for acres that meet the criteria within the enhancement guide sheet. Verify that a forest stand improvement treatment to initiate longleaf regeneration, or longleaf planting, was previously applied, that regenerating seedling and/or sapling longleaf pines are present, and that longleaf survival is threatened by competing species and/or other environmental stressors.
- Prior to implementation, provide assistance with interpretation of a new or updated FMP on acres targeted by this enhancement.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
    - Forest Stand Improvement (Code 666)

- Integrated Pest Management (Code 595)
- Prescribed Burning (Code 338)
- Brush Management (Code 314)
- Herbaceous Weed Control (Code 315)
- Tree /Shrub Establishment (Code 612)
- Tree/Shrub Site Preparation (Code 490)

- As needed, prior to implementation, NRCS will provide technical assistance by:
  - Preparing specifications for applying this enhancement for each site using approved guide sheets, implementation requirements, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and discussing the details with the participant.
  - Providing methods for conducting regeneration surveys.
- During implementation, provide technical assistance if requested by the participant.
- During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.
- After implementation, certify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328C

CONSERVATION STEWARDSHIP PROGRAM

Conservation crop rotation on recently converted CRP grass/legume cover

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Rotation minimizes disturbance (STIR less than 10) and reduces soil erosion below soil tolerance level. Enhancement not applicable on hayland.

Criteria

- Enhancement limited to acres where the conversion from Conservation Reserve Program (CRP) grass/legume conservation cover to annual cropland took place not more than 2 years prior to enrollment in Conservation Stewardship Program.
- This enhancement is not applicable on hayland.
- Crops shall be grown in a planned sequence as outlined in the implementation requirements.
- The crop rotation must include a minimum of three different crop types. For the purpose of this enhancement a cover crop is considered a different crop.
- Select crops, a tillage system, and cropping sequence(s) that will produce sufficient and timely quantities of biomass or crop residue which, in conjunction with other

practices in the management system that will reduce soil erosion from water and wind to a level below the soil tolerance (T) level (average annual soil loss).

CONSERVATION STEWARDSHIP PROGRAM

- Crop management must minimize soil disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 for the crop rotation (management STIR value).
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is planned for acres where the conversion from CRP grass/legume conservation cover to annual cropland took place no more than 2 years prior to enrollment in CSP. **Date of Conversion:** _____

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, verify the enhancement is not planned on hayland.
- ☐ Prior to implementation, use information provided from the participant to calculate soil loss estimates and STIR calculations using the current NRCS approved wind and water erosion prediction technologies. The planned rotation must meet the enhancement criteria of a management STIR value of less than 10 and average annual soil erosion from water and wind less than "T".

  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR value = _____

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to calculate soil loss estimates and STIR calculations. The applied rotation must meet the enhancement criteria above. **Soil erosion = _____t/ac/year and STIR value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328D

CONSERVATION STEWARDSHIP PROGRAM

Leave standing grain crops unharvested to benefit wildlife

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: ANIMALS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

Criteria

- Crops must be grown in a planned sequence as outlined in the plan. The crop rotation shall include a minimum of three different crops. For this purpose, a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.
- Select the crops and crop management activities that provide food, cover, and shelter for the targeted wildlife species using an approved habitat evaluation procedure.
- Leave a minimum ½ acre of unharvested, standing grain crops for each 40 acres of cropland. Unharvested plots shall be located in a single location on the 40 acre unit and additional plots shall be located on different 40 acres. *This enhancement is to be planned, contracted, and implemented on an entire field, not just the unharvested acres.*

CONSERVATION STEWARDSHIP PROGRAM

- Locate the unharvested plots adjacent to permanent cover such as brushy fence rows, field borders, forest land, or wetlands (this does not include newly established vegetation).
- Leave unharvested crops standing over winter until it is time to prepare the soil for planting the next crop.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, provide NRCS with the planned crop rotation.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

- ☐ Prior to implementation, develop a map showing planned location(s), crop type(s), and acreage of crops to be left unharvested.
- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or unharvested areas to verify the planned system meets the enhancement criteria.
- ☐ During implementation, take photos of all unharvested plots. Photos must indicate field location and date.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.
- ☐ After implementation, make a map showing implemented location(s), crop type(s), and acreage of crops that were left unharvested each year available for review by NRCS to verify implementation of the enhancement.
- ☐ After implementation, make photos of the unharvested plots available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.
- ☐ As needed, provide technical assistance in selecting crops for food, cover, and shelter according to the approved habitat evaluation procedure.
- ☐ As needed, provide additional assistance to the participant as requested.

- ☐ During implementation, evaluate planned crop changes, crop rotation, or unharvested areas to verify the planned system meets the enhancement criteria.
- ☐ After implementation, review the map(s) showing implemented location(s), crop type(s), and acreage of crops that were left unharvested each year, to verify implementation of the enhancement.
- ☐ After implementation, review photos of unharvested plots to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328F

CONSERVATION STEWARDSHIP PROGRAM

Modifications to improve soil health and increase soil organic matter

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Crops must be grown in a planned sequence as outlined in plan. The crop rotation must include a minimum of four different crops. For purposes of these criteria a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

CONSERVATION STEWARDSHIP PROGRAM

- Evaluation of the modified cropping system must produce a soil conditioning index (SCI) of zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. (management SCI value)

- Soil health assessment will be used to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion, as well as additional soil health objectives of the individual grower (primary assessment made in Year 1). During Year 3, a follow up assessment will be completed to allow time for changes to crop rotation and management activities to have an impact on soil health. No specific soil health assessment type is required or recommended by NRCS, but at a minimum the assessment must account for soil organic matter. The specific assessment selected should provide the grower information based on their soil health objectives.

- Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current/planned crop rotation and field operation(s) used for each crop.

Current/Planned Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Current/Planned Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

- ☐ Prior to implementation, select an assessment based on your soil health objectives.

Soil Health Assessment

Producer Objective	**Year 1 Assessment (Value)**	**Year 3 Assessment (Value)**
Soil Organic Matter (Required)		

CONSERVATION STEWARDSHIP PROGRAM

☐ During implementation, adjust crops, crop rotation, or field operations to improve the system after receiving the results of the soil health assessment. Complete in Year 1 and Year 3 at a minimum. Document adjustments below:

Adjusted Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Adjusted Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ Prior to implementation, verify the planned crop rotation includes at least four different crops.

☐ Prior to implementation, use information provided from the participant to calculate the management Soil Conditioning Index (SCI) value for each field using current NRCS wind and water erosion prediction technologies. Crop rotation must produce a positive trend in the Organic Matter (OM) subfactor value. **Management SCI Value = _____**
OM subfactor value = _____

- ☐ During implementation, evaluate planned adjustments in crops, crop rotation, or field operations to verify the new system meets the enhancement criteria.

- ☐ After implementation, evaluate the applied crop rotation or management using information provided from the participant to calculate SCI values to document that the applied rotation met the enhancement criteria.
  Management SCI Value = _____ OM subfactor value = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328G

CONSERVATION STEWARDSHIP PROGRAM

Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Conservation Practice 328: Conservation crop rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCMENT LIFE SPAN: 1 Year

Enhancement Description

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

Criteria

- This enhancement is limited to acres where the conversion of CRP grass/legume conservation cover to annual crops took place not more than 2 years prior to enrollment in CSP. This enhancement is not applicable on hayland.
- Crops must be grown in a planned sequence as outlined in plan. The crop rotation must include a minimum of four different crops. For purposes of these criteria a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

CONSERVATION STEWARDSHIP PROGRAM

- Grow crops that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index. (management SCI value)
- The crop rotation includes at least 2 years of high residue crops and/or cover crops per 3 years of the rotation. **(See STATE list of high residue crops)**
- For crop diversity, the planned crop sequence of at least 4 different crops should contain at least 3 different crop types; for example a mix of the following: warm season grass; warm season broadleaf; cool season grass; cool season broadleaf.
- Leave crop residue on the soil surface throughout the year.
- Keep a living root system established as much as practical for the given soil, cropping system, and climate area. Maximize root growth periods by planting the next crop or cover crop as soon as practical after the harvest and/or utilize perennial crops in the rotation. Aim to have living roots at least 90% of available growing days. **(See STATE provided guidance of options to maximize living root systems in local climate and cropping systems; determine available growing days and period of no growth, such as frozen periods in the north)**. Show before and after management files from current NRCS wind and water erosion prediction technologies to document benchmark and planned crop rotation to show increase in living root periods.
- Minimize all types of soil disturbance. No more than one crop-year in the rotation will have a Soil Tillage Intensity Rating (STIR) value greater than 20 and the rotation will have a positive trending SCI.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and planned field operation(s) used for each crop.

Current Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)	Crop Type (Warm Grass-WG, Cool Grass-CG, Warm Broadleaf-WB, Cool Broadleaf-CB)

Current Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management – Crop Rotation *(Crop rotation must include at least 4 different crops from 3 of the different crop types. The rotation must also include 2 years of high residue crops and/or cover crops per 3 years of the rotation. Use STATE list of high residue crops.)*

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)	Crop Type (Warm Grass-WG, Cool Grass-CG, Warm Broadleaf-WB, Cool Broadleaf-CB)

Planned Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, leave crop residue on the soil surface throughout the year.

☐ During implementation, take dated pictures with field indicated at least every 3 months to show residue or growing crops.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

☐ After implementation, provide for review pictures showing residue or growing crops throughout the year.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ Prior to implementation, verify the enhancement is planned for acres where the conversion from CRP grass/legume conservation cover to annual cropland took place no more than 2 years prior to enrollment in CSP. **Conversion Date:**_____

☐ Prior to implementation, verify the enhancement is not planned on hayland.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, verify the crop rotation includes at least 2 years of high residue crops and/or cover crops per 3 years of the rotation. (Use STATE list of high residue crops)

- ☐ Prior to implementation, verify the planned crop rotation includes at least 4 different crops and contains at least 3 different crop types; for example a mix of the following: warm season grass; warm season broadleaf; cool season grass; cool season broadleaf.
  Planned number of crops: _____
  Planned number of crop types:_____

- ☐ Prior to implementation, use information provided from the participant to calculate the management Soil Conditioning Index (SCI) value for each field using current NRCS wind and water erosion prediction technologies. Crop rotation must produce a positive trend in the Organic Matter (OM) subfactor value.
  Management SCI Value = _____ **OM subfactor value = _____**

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to document that the applied rotation met the enhancement criteria.
  Applied number of crops: _____
  Applied number of crop types:_____

- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to calculate SCI value to document that the applied rotation met the enhancement criteria.
  Management SCI Value = _____ OM subfactor value = _____

- ☐ After implementation, review pictures showing residue or growing green crops throughout the year to verify the applied system meets the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328I

CONSERVATION STEWARDSHIP PROGRAM

Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

Criteria

- This enhancement is applicable on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **(Refer to state specific guidance of options to maximize nutrient uptake in local climate and cropping systems)**

- Forage species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with applicable local criteria and soil/site conditions. **(Refer to state specific lists of forage crops known to effectively utilize and scavenge nutrients)**

- Select forage crop (single species or mix of two or more species) and planting dates which will not compete with the other crop(s) yield or harvest. ***If legumes are part of the forage mix, consider that this may add nutrients to the system.***

- Select forage crop that is compatible with other components of the crop rotation and for its ability to efficiently scavenge and utilize excess soil nutrients, specifically nitrogen or phosphorous, whichever is identified as a potential risk to water quality. Nutrient uptake only occurs when a crop is actively growing. Therefore, it is imperative that the crops in rotation be planted as soon as possible after forage crop harvest (hay/balage/haylage/etc.) to maximize nutrient cycling and minimize offsite transport of nutrients.

- Determine method and timing of forage crop harvest to meet client objectives. Harvest the forage crop as late as practical to maximize plant biomass production and nutrient uptake.

- Ensure any herbicides used in the crop rotation are compatible with forage crop selections.

- Do not burn forage or residue.

- Do not graze forage crop.

- Reduce or maintain soil erosion from water and wind to below soil tolerance (T) level (average annual soil loss).

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and field operation(s) used for each crop.

Document excess nutrients identified in soil tests. *Soil tests should be taken as close to production crop harvest as possible.*

Field	Soil Test Date	Nutrient (Nitrogen or Phosphorus)	Soil Test Nutrient Result (ppm or lbs/ac)

Current Management Rotation

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Current Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management Rotation including Forage Crop

Field	Planned Crops/Forage Crop (in sequence)	Planting Date	Harvest Date

Planned Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Forage Crop and Seeding Rate *(forage crop may be single species or mix of two or more species)*

Species	Variety	Seed Size	Typical Seeding Depth	Seeding Rate (PLS lbs/acre)	Percent of Mix (%)

Forage Crop Establishment and Management Considerations:

- ☐ Establish forage crop mix as soon as practical prior to or after harvest of the production crop.
- ☐ During implementation, forage crop must not be grazed or burned.
- ☐ During implementation, notify NRCS of any planned changes in forage crop mix or crop rotation, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, update the tables above to document the applied crop rotation for the contract period and provide to NRCS.

After implementation, complete the table below and provide to NRCS

Task	Provide information and details
Seedbed Preparation	
Seeding Date	
Seeding Depth	
Seeding Method	
Fertilizer, as needed	
Weed Management, as needed	
Harvest Date (window)	
Harvest Method	

NRCS will:

☐ As needed, provide technical assistance in selecting forage crop for the crop rotation or substitute species that would meet the criteria of the enhancement. Forage crop may consist of a single species or mix of two or more species.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is being planned on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **<REFER TO STATE SPECIFIC GUIDANCE>**

☐ Prior to implementation, use information provided from the participant to calculate the average annual soil erosion value (water and wind) for each field using NRCS erosion prediction technologies.

Benchmark Management Soil Loss = _____ tons/acre/year

Planned Management Soil Loss = _____ tons/acre/year

☐ During implementation, evaluate any planned changes in forage crop selected, timing in crop rotation, management, or field operations to verify the new system meets the enhancement criteria.

☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to calculate average annual erosion value to document that the applied rotation meets the enhancement criteria.

Applied Management Soil Loss = _____ tons/acre/year

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E328L

CONSERVATION STEWARDSHIP PROGRAM

Leaving tall crop residue for wildlife

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (annual and mixed)

RESOURCE CONCERN ADDRESSED: Animals

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

Criteria

- The entire crop field must be harvested with residual stubble height minimum of 14 inches on average throughout the field. Only acres with this minimum stubble height are eligible for payment.
- Stubble must remain undisturbed until the State designated date in the following year to provide cover throughout winter months
- Planting and management of cover crops is not prohibited if it does not compromise the height and structure of the stubble cover
- States will supply a list of eligible crops and specify the dates that stubble must remain undisturbed for this enhancement.
- When possible, reduce or eliminate the use of herbicide treatments on weedy growth between the rows to provide additional cover and food sources for wildlife.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, develop a map showing planned location(s), crop type(s) and acreage of crops to leave tall standing stubble.

☐ After implementation, provide photo documentation of stubble height left standing.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant.

☐ After implementation, verify stubble height and ensure stubble is left standing after winter months.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E328M

Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Conservation Practice 328: Conservation Cropping System

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Diversify existing crop rotation by adding pollinator friendly canola or sunflower crops into the rotation. The crop rotation shall include a minimum of three different crops. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides compliant with grower industry best management practice is allowed only during pre-bloom and bloom of canola or sunflower.

Criteria

- Crops will be grown in a planned sequence and shall include a minimum of three different crops.
- The crop rotation must include at least one year of canola or sunflower. Other pollinator friendly crops may be included. For these criteria, a pollinator friendly cover crop is considered a different crop. A pollinator friendly crop is defined as a crop, planted for harvest or as a cover crop, which provides nectar for pollinators and other beneficial insects. Examples of pollinator friendly crops are canola, sunflowers, clovers, and borage. To meet the purpose and definition of a pollinator friendly crop, these "flowering" crops must be allowed to bloom prior to harvest or termination. **<REFER TO STATE SPECIFIC LIST OF POLLINATOR FRIENDLY CROPS>**

CONSERVATION STEWARDSHIP PROGRAM

- Each year the enhancement is planned, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Plan/contract the actual acres planted to the pollinator friendly crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.
- Foliar systemic insecticides may not be applied to the pollinator friendly crop.
- Insecticides and fungicides applied during crop pre-bloom and bloom period of the canola or sunflower crop must be mitigated through integrated pest management and must follow industry best management practices.
    - Apply pesticides only when economic thresholds are met.
    - Apply pesticides at night or within two hours of sunset as this is when bees are least active.
    - Follow best practices for minimizing drift:
        - Use a low-drift nozzle, calibrate spray equipment, and use medium-to-coarse droplet size if possible.
        - Install cones or shrouds on field sprayers to reduce off- field movement.
        - When spraying fields, consider spot spraying or only applying pesticides to infested areas.
    - Select crop pest products with a residual activity of less than 8 hours.
    - Improve foraging areas for bees and other pollinators. Where possible, include flowering plants in non-crop areas. Avoid pesticide drift onto non-crop areas that include floral resources. Leave areas that include these resources intact whenever possible.

References

National Sunflower Association of Canada. Sunflower Production Guide. http://www.canadasunflower.com/production/sunflower-production-guide/

U. S. Canola Association. 2019. Best management Practices (BMPS) for Pollinator Protection in Canola Fields. https://www.uscanola.com/wp-content/uploads/2019/07/HBHC_Canola_030119.pdf

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation for all cropland acres on the operation. **<REFER TO STATE SPECIFIC LIST OF POLLINATOR FRIENDLY CROPS>**
- ☐ Prior to implementation, as needed, NRCS can provide technical assistance in selecting pollinator crops for the crop rotation or substitute species that would meet the criteria of the enhancement.
- ☐ Prior to implementation, provide maps for review by NRCS of the planned crop rotation, including areas which will include the pollinator friendly crops. Each year the enhancement is planned, at least 5% of the cropland acres on the operation must be planted to a pollinator friendly crop.

Current Management Rotation (complete table for each rotation)

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Planned Management Rotation including Pollinator Friendly Crops (complete table for each rotation)

Field	Planned Crops (in sequence)	Planting Date	Harvest Date	Acres in rotation

☐ During implementation, maintain records of any pesticide applications to canola, sunflower or pollinator friendly crops, including timing, material/product, application rate, and crop stage.

Field	Crop	Insecticide Applied	Application Date	Application Rate	Crop Stage

☐ During implementation, notify NRCS of any planned changes in crop rotation, pesticide applications, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS for review.

☐ After implementation, provide insecticide application records to NRCS for review to verify implementation meets the enhancement criteria.

NRCS will:

☐ As needed, provide technical assistance in selecting pollinator crops for the crop rotation or substitute species that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the crop rotation meets the criteria of the enhancement. *Plan/ contract the actual acres planted to canola or sunflower.*

☐ During implementation, evaluate any planned changes in crop rotation, pesticide applications, or management to verify the new system meets the enhancement criteria.

- ☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to verify the applied rotation meets the enhancement criteria.
- ☐ After implementation, review pesticide application records to verify implementation meets the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number_____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328N

Intercropping to improve soil health

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN ADDRESSED: Soil Quality Limitations

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

This enhancement involves the use of intercropping principles (i.e., growing two or more crops in close proximity to each other during part or all of their life cycles) to promote interactions that improve soil health, plant health, reduce inputs via increased biodiversity and contribute to pest management. Incorporating intercropping principles into an agricultural operation increases diversity and interaction between plants, arthropods, mammals, birds and microorganisms resulting in a more stable crop-ecosystem and a more efficient use of space, water, sunlight and nutrients. Furthermore, soil health is benefited by increasing ground coverage with living vegetation which reduces erosion and by increasing the quantity and diversity of root exudates which enhances soil fauna. This collaborative type of crop management mimics nature and is subject to fewer pest outbreaks, improved nutrient cycling and crop nutrient uptake, and increased water infiltration and moisture retention. **This enhancement cannot be used for annual hay or silage crops. It is for grain/seed/vegetable production only.**

Criteria

One or more of the following intercropping systems shall be used. Systems can be mixed during the contract period allowing for within year diversity on the same field. Producers should consult with the UDSA-Risk Management Agency (RMA) to clarify and understand how the use of any of the criteria options below might impact insurability of any cash crop grown using these methods.

- Plant two or more crops simultaneously in the same field. For example, planting chickpeas and flax together either in alternate rows or mixed within rows. Another example could be planting vegetables that perform well together, e.g. the "three sisters" intercropping system of corn, beans and squash.

- Relay intercropping – grow two or more crops on the same field with the planting of the second crop before the first crop is harvested. This cropping strategy enables production of a second crop in areas where time for seeding the second crop is considered inadequate for double cropping. For example, seeding soybeans into wheat that is still growing.

- Strip intercropping – grow crops in alternate strips wide enough to permit separate crop production machinery, but close enough for crops to interact (e.g., planting alternating strips of corn and soybeans 6 rows each or alternating strips of corn and Sudan grass). Generally, the maximum width of individual strips for effective interaction of crop pests and their natural enemies is about 30 ft. Note: this criterion is not the same as NRCS Conservation Practice Stripcropping Code 585

Documentation and Implementation Requirements

Participant will:

- Prior to implementation, provide NRCS with the current and planned crop rotation, including intercropping system used, for all cropland acres on the operation.
- Prior to implementation, provide maps for review by NRCS of the planned crop rotation.
- During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- During implementation, take dated pictures with field indicated at least every 3 months to show growing intercrops.
- After implementation, provide for review pictures showing growing intercrops throughout the year.

Current Management Rotation (complete table for each rotation)

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Planned Management Rotation With Intercropping (complete table for each rotation)

Field	Planned Crops (in sequence)	Planting Date	Harvest Date

NRCS will:

- As needed, provide technical assistance in selecting intercropping systems for the crop rotation that would meet the criteria of the enhancement.
- As needed, provide additional assistance to the participant as requested.
- Prior to implementation, verify the crop rotation meets the criteria of the enhancement. ***Plan/contract the actual acres planted to the intercrops.***
- During implementation, evaluate any planned changes in crops, crop rotation, or management to verify the new system meets the enhancement criteria.
- After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to verify the applied rotation meets the enhancement criteria.
- After implementation, review photos of the intercropping system.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329A

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce soil erosion

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish no till system to reduce sheet and rill and wind erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation (average annual soil loss).
- No full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The Soil Tillage Intensity Rating value must include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow

periods). Each crop must have a Soil Tillage Intensity Rating value of no greater than 10.

CONSERVATION STEWARDSHIP PROGRAM

- Use the current approved water and wind erosion prediction technology to determine the:
    - amount of randomly distributed surface residue needed;
    - time of year the residue needs to be present in the field, and
    - amount of surface soil disturbance allowed to reduce erosion to the desired level.
- Calculations must account for the effects of other practices in the management system.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, use information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a soil loss at or

CONSERVATION STEWARDSHIP PROGRAM

below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 10 for each crop in the planned rotation.

"T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____

☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329B

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce tillage induced particulate matter

Conservation Practice 329: Residue and Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Air

PRACTICE LIFE SPAN: 1 Year

Enhancement Description

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Field(s) must have an average annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination

of the current cash crop (includes fallow periods). Each crop must have a STIR value of no greater than 10.

- Use the current approved water and/or wind erosion prediction technology to determine the:
    - amount of randomly distributed surface residue needed;
    - time of year the residue needs to be present in the field, and
    - amount of surface soil disturbance allowed to reduce erosion to the desired level.
- Calculations shall account for the effects of other practices in the management system.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue shall be burned.

☐ During implementation, all residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

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NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify that the field to be establish in no-till has a soil loss at or below the soil tolerance (T) level for water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E329C

CONSERVATION STEWARDSHIP PROGRAM

No till to increase plant-available moisture

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value shall be no greater than 20.

CONSERVATION STEWARDSHIP PROGRAM

- Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

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Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ During implementation, maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and estimated surface residue cover using the NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a Soil Tillage Intensity Rating value of no greater than 20 for each crop in the planned rotation, and the estimated surface residue cover.
  STIR values for each crop in the rotation = _____

  Estimated surface residue cover for each crop in the rotation = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to the Soil Tillage Intensity Rating value, and estimated surface residue cover to document that the applied rotation met the enhancement criteria.
  STIR values for each crop in the rotation = _____

  Estimated surface residue cover for each crop in the rotation = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329D

CONSERVATION STEWARDSHIP PROGRAM

No till system to increase soil health and soil organic matter content

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Criteria

- All residues must be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Residue must not be burned, grazed, or harvested.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value shall be no greater than 20.

CONSERVATION STEWARDSHIP PROGRAM

- Evaluation of the cropping system (management) using the current approved soil conditioning index (SCI) procedure results in zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned, grazed, or harvested.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating (STIR) values using NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a Soil Tillage Intensity Rating value of no greater than 20 for each crop in the planned rotation.
  STIR values for each crop = _____
- ☐ Prior to implementation, use information provided from the participant and the approved soil conditioning index (SCI) procedure to verify the SCI is zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. **SCI value = _____ and OM subfactor value = _____**
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  STIR values for each crop = _____
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil conditioning index (SCI) and Organic Matter (OM) subfactor values to document that the applied rotation met the enhancement criteria. **SCI value = _____ and OM subfactor value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329E

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce energy

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Criteria

- Residue shall not be burned.
- All residues must be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The Soil Tillage Intensity Rating (STIR) value must include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). Each crop must have a STIR value no greater than 20.

- Reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system. Use the current NRCS wind and water erosion prediction technologies for determining energy use to document energy use reductions.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the current (benchmark) and planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Current (Benchmark) Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Current (Benchmark) Field Operation	Timing of Field Operation (month/year)

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Planned Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- ☐ During implementation, reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use the information provided from the participant to calculate the Soil Tillage Intensity Rating values and energy consumption for both the current system and the planned system using the approved NRCS wind and water erosion prediction technologies. Verify the Soil Tillage Intensity Rating value is no greater than 20 for each crop in the planned rotation and total energy consumption is reduced by at least 25%.

  Current STIR values = _____ and Energy Consumption = _____

  Planned STIR values = _____ and Energy Consumption = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if changes were made to the planned crop(s), crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and total energy consumption to document that the applied rotation met the enhancement criteria.

  Applied STIR values = _____ and Energy Consumption = _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E334A

CONSERVATION STEWARDSHIP PROGRAM

Controlled traffic farming to reduce compaction

Conservation Practice 334: Controlled Traffic Farming

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 5 Year

Enhancement Description

Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Criteria

- Ensure that controlled traffic lanes are designed and used in a manner that avoids concentrated flow that may result in gully erosion.
- Limit wheel/track traffic to no more than 25 percent of the soil surface. The same tracks must be used for all high load traffic continually. High wheel load traffic is defined here as any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.
- For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks.
- If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

- Use a Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic when the designated traffic lanes are obscured.
- Once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, develop a plan to limit wheel/track traffic to no more than 25 percent of the soil surface.
- ☐ Prior to implementation, complete the following table to provide the current and any planned changes to crop row width.

Crops in Rotation (shown in sequence)	Current Crop Row Width	Planned Crop Row Width

- ☐ Prior to implementation, complete the following table to provide the current equipment width and spacing used for the above crop rotation.

Equipment Used in Crop Rotation	Width of Equipment (feet)	Tire/Track Spacing (on-center Inches)

- ☐ Prior to implementation, complete the following table to provide any **planned changes** to equipment width and spacing used for the above crop rotation.

Equipment used in Crop Rotation	Width of equipment (feet)	Tire/Track spacing (on-center Inches)

Equipment used in Crop Rotation	Width of equipment (feet)	Tire/Track spacing (on-center Inches)

- ☐ During implementation, the same tracks must be used for all high load traffic continually. High wheel load traffic is any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.
- ☐ During implementation, use a Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic when the designated traffic lanes are obscured.
- ☐ During implementation, once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**
- ☐ During implementation, if ruts develop, use tillage or other specialized equipment to remove ruts and reestablish controlled traffic lanes.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the developed plan will limit wheel/track traffic to no more than 25 percent of the soil surface. **Percent wheel/track traffic = _____**
- ☐ Prior to implementation, ensure that controlled traffic lanes are planned and implemented in a manner that avoids concentrated flow that may result in gully erosion.
- ☐ After implementation, verify the plan was implemented to limit wheel/track traffic to no more than 25 percent of the soil surface. **Percent wheel/track traffic = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____
Fiscal Year Completed _____

CONSERVATION STEWARDSHIP PROGRAM

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345A

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce soil erosion

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value ratings shall be no greater than 40, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Use the current approved soil erosion prediction technology for water and wind erosion to determine the:

- Amount of randomly distributed surface residue needed.
- Time of year the residue needs to be present in the field.
- Amount of surface soil disturbance allowed to reduce erosion to the desired level of average annual soil loss.
- Calculations must account for the effects of other practices in the management system.

- In ridge-till systems, plan ridge height and ridge orientation to manage runoff and minimize erosion, with a maximum row grade of 4%.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use the information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 40 for each crop in the planned rotation.

  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345B

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce tillage induced particulate matter

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 40, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Reduce or modify tillage operations that create dust, especially during critical air quality periods.

- Adopt tillage practices that reduce particulate emissions.

CONSERVATION STEWARDSHIP PROGRAM

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

CONSERVATION STEWARDSHIP PROGRAM

☐ Prior to implementation, verify that the field to be establish in no-till has a soil loss at or below the soil tolerance (T) level for water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation.

"T"= _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____

☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345C

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to increase plant-available moisture

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- Field must have an annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- The Soil Tillage Intensity Rating (STIR) value MUST include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.

- Maintain a minimum 60 percent surface residue cover throughout the year.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ During implementation, maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

- ☐ Prior to implementation, use information provided from the participant to calculate the soil loss, Soil Tillage Intensity Rating values, and estimated surface residue cover using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have an annual soil loss at or below the soil tolerance (T) level, a Soil Tillage Intensity Rating value of no greater than 80 for each crop in the planned rotation, and the estimated surface residue cover.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year
  STIR values for each crop in the rotation = _____
  Estimated surface residue cover for each crop in the rotation = _____

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information the provided from the participant to calculate soil loss, Soil Tillage Intensity Rating values, and estimated surface residue cover to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year
  STIR values for each crop in the rotation = _____
  Estimated surface residue cover for each crop in the rotation = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345D

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to increase soil health and soil organic matter content

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn residues.
- Field must have an annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop

STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.

- Evaluation of the cropping system using the current approved soil conditioning index (SCI) procedure results in zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation (management SCI value).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, use information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have an annual soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 80 for each crop in the planned rotation.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ Prior to implementation, use information provided from the participant and the approved soil conditioning index (SCI) procedure to verify the SCI is zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. **SCI value = _____ and OM subfactor value = _____**
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil conditioning index (SCI) and Organic Matter (OM) subfactor values to document that the applied rotation met the enhancement criteria. **SCI value = _____ and OM subfactor value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345E

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce energy use

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Reduce the total energy consumption associated with field operations by at least 25% compared to the benchmark condition. The current NRCS wind and water erosion

prediction technologies must be used for determining energy use to document energy use reductions.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current (benchmark) and planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Current (Benchmark) Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Current (Benchmark) Field Operation	Timing of Field Operation (month/year)

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Planned Field Operation	Timing of Field Operation (month/year)

- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.
- ☐ During implementation, reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and energy consumption for both the current system and the planned system using the approved NRCS wind and water erosion prediction technologies. Verify the Soil Tillage Intensity Rating value is no greater than 80 for each crop in the planned rotation and total energy consumption is reduced by at least 25%.
  Current STIR values = _____ and Energy Consumption = _____
  Planned STIR values = _____ and Energy Consumption = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if changes were made to the planned crops, crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and total energy consumption to document that the applied rotation met the enhancement criteria.
  Applied STIR values = _____ and Energy Consumption = _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E381A

Silvopasture to improve wildlife habitat

Conservation Practice 381: Silvopasture Establishment

APPLICABLE LAND USE: Pasture; Forest; Associated Agricultural Land

RESOURCE CONCERN: Plants; Animals

ENHANCEMENT LIFE SPAN: 15 years

Enhancement Description

Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

Criteria

- Tree species and forage species must be adapted to the site and compatible with the planned management of the site.
- No plants on the federal or state noxious weeds list shall be planted.
- Where trees will be added to existing pasture, site preparation should be based on existing vegetation and soil conditions. Trees will be planted at an appropriate density to allow acceptable forage production and wood products.
- If pesticides are used, label recommendations must be followed.
- Only viable, high quality and adapted planting stock or seed will be used.
- Plant nutrients and/or soil amendments for establishment purposes will be applied according to a current soil test. Legume seed will be pre-inoculated or inoculated with the proper viable strain of Rhizobia immediately before planting.

CONSERVATION STEWARDSHIP PROGRAM

- Establish forage species and understory shrubs that will provide forage, browse, seed, cover, or nesting habitat for the wildlife species of concern. For additional guidance refer to NRCS Conservation Practice Standards Upland Wildlife Habitat Management (Code 645).
- Favor herbaceous seed mixes that include a diverse mix of native forbs and/or legumes to benefit wildlife including pollinators. Select species that vary in attributes such as timing of flowering, and production of leaves and fruit.
- Plantings will be protected from grazing until an adequate stand is established and meets the species specific, local standard for beginning grazing.

CONSERVATION STEWARDSHIP PROGRAM

Documentation Implementation Requirements

Participant will:

☐ Prior to implementation, select a tree or shrub species for establishment.

Tree or Shrub species	
Trees per acre	
Percent canopy cover	

☐ Prior to implementation, develop a grazing plan to keep grazing periods sufficiently short to allow for plants to recover before re-grazing occurs.

☐ During implementation, keep the following documentation:

- Records and photographs of planting preparation and any materials purchased or materials on hand used for the implementation of the enhancement.
- Documentation of seed (Pure Live Seed) and any fertilizer or soil amendments used for the implementation of the enhancement.

☐ After implementation, make documentation and photographs of livestock turn in/turn out grazing records for each field available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, make the forage planting/or tree planting and grazing records available for review by NRCS to verify implementation of the enhancement.

☐ The State approved NRCS Wildlife Habitat Evaluation Guide (WHEG) as completed and certified by an NRCS or partner wildlife biologist. Wildlife species of concern for the silvopastoral area will be specified on the WHEG. Total WHEG score after installation will equal 0.60 or greater.

NRCS will:

☐ Prior to implementation, complete the State approved NRCS Wildlife Habitat Evaluation Guide (WHEG) as completed and certified by an NRCS or partner wildlife biologist when applicable. Specific pollinator species targeted will be notated on the WHEG, and total

CONSERVATION STEWARDSHIP PROGRAM

score after implementation will equal 0.60 or greater.
WHEG score after implementation = _____

☐ Prior to implementation, verify a grazing plan was developed to keep grazing periods sufficiently short to allow for forages to recover before re-grazing occurs.

☐ Prior to implementation and as needed, NRCS will provide technical assistance:

- Planning site preparation and establishment specifications meeting NRCS Conservation Practice Standard Forage and Biomass Planting (Code 512) or Tree/Shrub Site Preparation (Code 490) and Tree/Shrub Establishment (Code 612).
- Prepare specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- Develop a grazing plan to keep grazing periods sufficiently short to allow for forages to recover before re-grazing occurs.

☐ During implementation, evaluate any planned changes to verify they meets the enhancement criteria.

☐ After implementation, verify the planned perennial planting was established to specifications developed for the site.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

CONSERVATION ENHANCEMENT ACTIVITY

E383A

CONSERVATION STEWARDSHIP PROGRAM

Grazing-maintained fuel break to reduce the risk of fire

Conservation Practice 383: Fuel break

APPLICABLE LAND USE: Forest and Range

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Fuel Break (Code 383) as listed below, and additional criteria as required by the NRCS State Office.

- A fuel break has been constructed around the property or around the targeted site to minimize the risk of damaging wildfires and to enhance the ability to conduct prescribed burning.
- Fuel breaks will be planted with desirable warm-season perennial vegetation as prescribed by local grazing land specialists. Over-seeding with desirable cool season annual forages will take place in the fall.
- The vegetation on the fuel break will be managed using a prescribed grazing plan. Animal stocking levels and rotation periods are designed to manage vegetation and avoid harm to sensitive plants.
- Manage grasses and forbs to minimize fine fuels.

- If trees or shrubs are not sufficiently controlled through grazing management, single-tree treatment with saws or chemicals will be applied.
- If herbicides are used, refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, determine and document the existing fuel breaks on the enrolled acres. Provide as much detail as possible such as length, average width, existing vegetation and past management activities. (NRCS will provide technical assistance, as needed)
- ☐ Prior to implementation, determine and document those sites capable of integrating into a grazing management plan with the establishment of desirable warm-season perennial vegetation and cool season annual forages. (NRCS will provide technical assistance, as needed)
- ☐ Prior to implementation, develop or update a prescribed grazing plan to guide the establishment of forages, animal stocking levels and rotation periods. Provide to NRCS field office. (NRCS will provide technical assistance, as needed)
- ☐ (If prescribed burning is used) Prior to implementation, in combination with grazing to manage vegetation, develop or update a prescribed burn plan to guide the frequency and duration of burning. Provide to NRCS. (NRCS will provide technical assistance, as needed)
    - o Prior to implementation of a prescribed burn, assess the existing fuel load using appropriate tools and methods for the geographic area. Determine the need for pre-treatment of the vegetation and fuels to facilitate a desired fire intensity to achieve the vegetation objectives. Apply as needed, complimentary NRCS Conservation Practice Standards such as Firebreak (Code 394) and Woody Residue Treatment (Code 384) to achieve appropriate conditions. (NRCS will provide technical assistance, as needed)
    - o Prior to implementation, acquire a written burn plan for the enrolled land use acres that meets the NRCS Conservation Practice Standard Prescribed Burning (Code 338) and any additional state NRCS requirements. Provide to NRCS for review and approval.
    - o Prior to implementation of a prescribed burn, acquire all necessary approvals and permits (local, state, federal as applicable).
    - o During implementation, and prior to ignition of each prescribed burn, acquire a current fire weather forecast and ensure all weather conditions are within those prescribed in the written burn plan. If conditions are not within prescription, postpone burn.
    - o During implementation, and prior to ignition of any prescribed burn, notify NRCS to confirm NRCS verification for any planned changes will meet NRCS or State required enhancement criteria.
    - o After implementation of each prescribed burn, conduct a post-burn evaluation as required within the burn plan and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

- During implementation, install and maintain erosion control measures as needed for the site. (NRCS will provide technical assistance, as needed.)
- After implementation, provide NRCS documentation of the vegetation established and timing of grazing activities on the fuel break.

NRCS will:

- Prior to implementation, as needed, provide technical assistance in determining sites for enhancement implementation that meet specified criteria.
- Prior to implementation, NRCS will provide participant recommendations for suitable perennial and annual vegetation establishment and provide assistance in development or revision of a prescribed grazing plan.
- Prior to implementation, as needed, provide explanation and technical assistance to the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - Prescribed Burning (Code 338).
  - Fuelbreak (Code 383).
  - Firebreak (Code 394).
  - Woody Residue Treatment (Code 384).
  - Integrated Pest Management (Code 595).
  - Additional Conservation Practice Standards for erosion control, as needed for the site.
- (If prescribed burning is used) Prior to implementation, review and certify the prescribed burn plan meets the enhancement criteria and any additional state NRCS requirements.
- Prior to implementation, review the prescribed grazing plan to ensure objectives of the enhancement will be met when used in combination with all other practices.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- (If prescribed burning is used) After implementation of each prescribed burn, review the post burn evaluation provided by the participant. Discuss any encountered issues, and as needed, provide assistance for changes in planning and procedure for the remaining prescribed burns.
- After implementation, review documentation of the vegetation established and timing of grazing activities on the fuel break to verify the enhancement was implemented to meet the enhancement criteria.

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E391A

CONSERVATION STEWARDSHIP PROGRAM

Increase riparian forest buffer width for sediment and nutrient reduction

Conservation Practice 391: Riparian Forest Buffer

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial) and Associated Ag Land

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 15 Years

Enhancement Description

Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Criteria

- Existing buffer width shall be at least 35 feet or (if applicable) the minimum State buffer-width requirement, whichever is greater. Maximum enhancement buffer width may be increased up to the greater of 180 feet or the State-allowed maximum width.
- To the extent possible, the buffer area and extended buffer will be shaped and vegetated to increase overland flow interception.
- Excessive sheet-rill and concentrated-flow erosion will be controlled in the areas immediately adjacent and up-gradient of the buffer site. Overland flow through the riparian area will be maintained as sheet flow.

- Existing functional underground drains through the riparian area will be plugged, removed or replaced with perforated pipe/end plugs or water control structures.

- Dominant vegetation will consist of existing, naturally regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site and the intended purpose of nutrient reduction.

- Use tree and shrub species that are native and non-invasive. Substitution with improved and locally accepted cultivars or purpose-specific species is allowed. For plantings and seeding, only viable, high-quality and adapted plant materials will be used.

- Favor tree and shrub species that have multiple values such as those suited for timber, nuts, fruit, florals, browse, nesting, and aesthetics.

- Periodic removal of some forest products such as high value trees, medicinal herbs, nuts, and fruits is permitted provided the buffer area is not compromised by the loss of vegetation or harvesting disturbance.

- Necessary site preparation and planting shall be done at a time and manner to insure survival and growth of selected species.

- Harmful plant and animal pests present on the site will be controlled or eliminated as necessary to achieve and maintain the intended purpose. Pest management will be conducted in a manner that mitigates impacts to pollinators.

- Livestock shall be controlled or excluded as necessary to achieve the buffer's water quality improvement purpose. If livestock is present, follow a Prescribed Grazing Plan (CPS 528) and defer grazing for a minimum of two years.

- Design the expanded buffer enhancement for an expected life of at least 15 years.

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, prepare the planned buffer area according to the planting plan NRCS has developed with you. Refer to NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391). (NRCS will provide technical assistance)

☐ Prior to implementation, select planting date, method, and density/spacing appropriate for the site and soil conditions. (NRCS will provide technical assistance.)

Planting Date	
Planting Method	
Density and spacing	

☐ Prior to implementation, work closely with NRCS to select plant species that are adapted to your specific site and meet the goals of this enhancement.

Species	Vegetative or Rootstock	Size	Protection (tubes, mats, nets)

☐ During implementation and before planting, grade the site, as needed, to eliminate concentrated flow through the buffer including water coming from uphill of the buffer.

☐ During implementation and before planting, replace underground tile drains that pass through the buffer with rigid, non-perforated pipe or install a water control device that allows for overflow management.

☐ During implementation, install and maintain erosion control measures as needed, such as silt fencing and mulching.

☐ During implementation, conduct planting of selected species according to dates, methods, spacing and other requirements listed in the planting plan.

☐ During implementation, notify NRCS of any planned changes to allow NRCS to verify that the changes meet NRCS enhancement criteria.

- ☐ After Implementation, control harmful pests and vegetation and in a manner that limits effects to pollinators. Inspect and maintain tubes and protection measures regularly.

- ☐ After implementation, livestock and wildlife may need be controlled or excluded to achieve the buffer's water quality improvement purpose. If livestock are present, follow a Prescribed Grazing Plan (Code 528) and defer grazing for a minimum of two years. Wildlife may need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.

NRCS will:

- ☐ Prior to implementation, verify the enhancement is planned for cropland.

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391) to show how it relates to this enhancement.

- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included in the planting list.

- ☐ Prior to implementation, NRCS will provide technical assistance on:

    - Preparing a site preparation and planting plan that meets NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391) and lists the species, vegetation type, density, protection measures, and planting dates.

    - Selecting planting techniques and timing appropriate for the site and soil conditions.

    - Assessing impacts of drainage removal/plugging on adjacent land units and uses.

    - Preparing specifications for applying this enhancement for each site using approved state implementation requirements, national technical notes, appropriate state technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- ☐ During implementation, review any planned changes to ensure they meet the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications provided to the participant.
- ☐ After implementation, verify that any underground drains through the riparian area, if they exist, were plugged, removed or replaced with perforated pipe/end plugs or structures for flow control.
- ☐ After implementation, verify the vegetation was established and any protections required are being maintained according to the specifications provided to the participant.
- ☐ After implementation verify livestock are controlled or excluded as necessary to achieve the buffer's water quality improvement purpose. If livestock are present, verify a Prescribed Grazing Plan (Code 528) is being followed and that grazing is being deferred for a minimum of two years.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449A

CONSERVATION STEWARDSHIP PROGRAM

Complete pumping plant evaluation for water savings

CONSERVATION PRACTICE: 449 - Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 years

Enhancement Description

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more.

Criteria

- Pump test evaluation will include all irrigation pumps on fields where the activity is implemented. There could be multiple pumps that are used on single or multiple fields.

- Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season.
  - Pressure at different flow rates based on partial or complete irrigation.
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated.
  - Estimate of friction loss in pipelines based on pressure drop in lines during test.

- The irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice, Irrigation Water Management (Code 449):
  - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
  - Methods used to measure or determine the flow rate or volume of the irrigation applications.

- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- The Irrigation water management plan explains:
  - How irrigation system meets crop needs, while maximizing irrigation water efficiency.
  - Seasonal or annual planned water application volumes by crop.
  - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
  - Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
  - Information on how to recognize irrigation induced erosion and how to mitigate it.
  - Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
  - Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station
- Recordkeeping documents for the irrigator to use during operation and management.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.

- ☐ Arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.

- ☐ Acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.

CONSERVATION STEWARDSHIP PROGRAM

During implementation

- ☐ Follow the irrigation water management plan and keep records as required by the plan.
- ☐ Have a pump test evaluation performed on all irrigation pumps on fields where activity is implemented.

After implementation

- ☐ Make the following items available for review by NRCS to verify implementation of the enhancement:
  - Irrigation water management plan and records kept.
  - Pump test evaluation report(s).
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation. Calculate the reduction of water use based on before and after conditions.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) to participant as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.

After implementation

- ☐ Verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E449C

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 2-5, soil moisture monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

Criteria

Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

- An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
- Methods used to measure or determine the flow rate or volume of the irrigation applications.
- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- Irrigation water management plan explains:

- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- How data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station

- Recordkeeping documents for the irrigator to use during operation and management.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (449) requirements.

- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.

- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
  - o Irrigation water management plan and records kept
  - o Changes made to address distribution uniformity deficiencies

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (CPS 449) as it relates to implementing this enhancement

- ☐ As needed, provide additional technical assistance to the participant as requested.

- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing participant records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449D

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 1, Equipment and soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management

Criteria

- Equipment may include; weather station, sensors, flow meter, data loggers, cellular service, as needed to monitor soil moisture, determine and forecast crop water use and remotely control irrigation system.
- Subscription service provided by others may be used as an alternative.
- Data to be monitored includes crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment, and a data logger to log continuous weather data including rainfall, temperature, solar radiation, humidity, wind

speed and soil moisture/water level sensors data that can be downloaded to a personal computer and associated graphing software.

- Producer monitors the station during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensors, field checks and weather station data.

- Producer keeps records of collected data and resulting irrigation decisions. This enhancement only applies to year one of IWM. The appropriate labor-only IWM enhancements apply in subsequent contract years.

- If a weather station is installed, install within 1 mile of fields where practice is implemented. The weather station will record each of the following (at a minimum of four times per hour),
    - o High and low temperature
    - o Precipitation
    - o Humidity
    - o Wind speed and duration
    - o Solar radiation

- Sensors, datalogger and required telemetry are installed on fields where practice is implemented as indicated in the Irrigation water management plan.

- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - o An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
    - o Methods used to measure or determine the flow rate or volume of the irrigation applications.
    - o Measurement records showing the amount of water used to irrigate, as it comes onto the farm and goes to each field.
    - o Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
    - o The Irrigation water management plan explains;

CONSERVATION STEWARDSHIP PROGRAM

- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station.

o Recordkeeping documents for the irrigator to use during operation and management

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- ☐ Prior to implementation, acquire NRCS approval of selected weather station, sensors, data logger, etc. or subscription service.
- ☐ During implementation, ensure installation meets manufacturer recommendations.
- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
    - o Irrigation water management plan and records kept (i.e. , date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data)
    - o Changes made to address distribution uniformity deficiencies
    - o Documentation of equipment installed (i.e. weather station, sensors, data logger, etc.) to NRCS
    - o If a suscription service is used, provide location of equipment, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement
- ☐ As needed, provide additional assistance to the participant as requested.
- ☐ Prior to implementation, review and approve producer's selected weather station, sensors, data logger, etc. or subscription service.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ After implementation, verify installation of weather station, sensors, etc.
- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449F

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Year 1, Equipment with Soil moisture or Water Level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

This activity involves monitoring soil moisture or water levels within a surface irrigated field for intermediate irrigation water management by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment is installed and utilized to log data and retrieve the data periodically throughout the season, so irrigation decisions can be made based on scientific data. Maximum time between data retrievals is weekly.

Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.

Criteria

General

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall,

temperature; water level sensor with data collection system; permanent flowmeter

- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment with data collection systems that can continuously record data throughout the irrigation season.
- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used) and soils.
    - Method used to measure or determine the flow rate or volume of the irrigation water applications
    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field
    - Documentation of the scientific method used to schedule the timing and amount of irrigation application
    - Irrigation water management plan explaining:
        - How irrigation meets crop needs while maximizing irrigation water efficiency
        - Seasonal or annual planned water application volumes by crop
        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth
        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation
        - Information on how to recognize irrigation induced erosion and how to mitigate it
        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions
        - Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station

- Recordkeeping documents for the irrigator to use during the operation and management

CONSERVATION STEWARDSHIP PROGRAM

Additional Criteria of soil moisture devices

- Installation of each soil moisture set will include the ability to collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region
- Number of soil moisture sets will be installed based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of flow measurement devices

- Permanent flow meters will be installed at all wells/relifts that are included in the approved IWM plan

Additional Criteria of water level devices

- Sensor is installed in a basin field with a data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day

Additional Criteria of weather stations

CONSERVATION STEWARDSHIP PROGRAM

- Weather station is installed in a central location as defined by the irrigation water management plan, but no more than 2 miles separation

- Weather stations will record each of the following at a minimum of four times per hour:
  - High and low temperature
  - Precipitation
  - Humidity
  - Wind speed and duration and direction
  - Solar radiation

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- Acquire an irrigation water management plan meeting NRCS Conservation Practice Irrigation Water Management (Code 449) requirements
- Acquire NRCS approval of all irrigation water management devices that will be utilized for the plan implementation

During installation or implementation

- Ensure each irrigation water management device is installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- Monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data

After implementation

- Make the following items available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan is followed, and records kept
    - Changes made to address distribution uniformity deficiencies
    - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation

NRCS will:

Prior to implementation

- Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement

CONSERVATION STEWARDSHIP PROGRAM

- Provide additional assistance to the participant as requested
- Review and approve producer's selected equipment After Implementation
- Verify installation of all irrigation water management equipment
- Verify implementation of the irrigation water management plan by:
    - Reviewing records kept during enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449G

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Years 2-5, Soil Moisture or Water Level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment was bought in year one and is utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly.

Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.

Criteria

General

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system

- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- Irrigation water management plan from year one is followed in accordance to the NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used) and soils.
    - Method used to measure or determine the flow rate or volume of the irrigation water applications
    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field
    - Documentation of the scientific method used to schedule the timing and amount of irrigation application
    - Irrigation water management plan explaining:
        - How irrigation meets crop needs while maximizing irrigation water efficiency
        - Seasonal or annual planned water application volumes by crop
        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth
        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation
        - Information on how to recognize irrigation induced erosion and how to mitigate it
        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions
        - Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station
    - Recordkeeping documents for the irrigator to use during the operation and management

Additional Criteria of soil moisture devices

- Each year re-install the soil moisture set to collect data at a minimum of 2 approved

depths based on crop and soil characteristics of the region

- Number of soil moisture sets will be installed based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of water level devices

- Re-install sensor/gage each year in a basin field with a data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation

- Review the irrigation water management plan to make any necessary adjustments from the previous year.
- Ensure the irrigation water management plan continues to meet the NRCS Conservation Practice Irrigation Water Management (Code 449) requirements.

During installation or implementation

- Ensure each irrigation water management device is re-installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- Monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data

After implementation

- Make the following items available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan is followed, and records kept
    - Changes made to address distribution uniformity deficiencies
    - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation

NRCS will:

Prior to implementation

- Provide and explain NRCS Conservation Practice Standard Irrigation Water

Management (Code 449) as it relates to implementing this enhancement

- Provide additional assistance to the participant as requested After Implementation
- Verify re-installation of all irrigation water management equipment each year
- Verify implementation of the irrigation water management plan by:
    - Reviewing records kept during each year of enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E449H

Intermediate IWM— Years 2 -5, using soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Monitoring soil moisture or water levels within an irrigated field for implementing an intermediate irrigation water management plan using soil moisture data to facilitate management decisions.

Criteria

- Equipment previously installed (through preceding enhancement) must include soil moisture sensors with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system; and permanent flowmeter.
- Monitoring of the following items required:
    - Irrigation water applied
    - Crop water use
    - Status of heat and/or frost conditions to permit the producer to make informed irrigation decisions

CONSERVATION STEWARDSHIP PROGRAM

- Perform regular maintenance and monitoring of equipment with data collection systems that continuously record data throughout the irrigation season.

- Follow an irrigation water management plan which includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used), and soils.

    - Method used to measure or determine the flow rate or volume of the irrigation water applications.

    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field.

    - Documentation of the scientific method used to schedule the timing and amount of irrigation application.

    - Irrigation water management plan explaining:

        - How irrigation meets crop needs while maximizing irrigation water efficiency.

        - Seasonal or annual planned water application volumes by crop.

        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.

        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation.

        - Information on how to recognize irrigation induced erosion and how to mitigate it.

        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions.

- Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station.

  - Record keeping documents for the irrigator to use during the operation and management.

Additional Criteria of Soil Moisture Devices

- Soil moisture sensors collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region.
- Number of soil moisture data sets will be based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of Flow Measurement Devices

- Permanent flow meters data collected at all wells/relifts that are included in the approved IWM plan.

Additional Criteria of Water Level Devices

- Data from sensors installed in a basin field from data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Additional Criteria of Weather Stations

- Weather station data from a central location as defined by the irrigation water management plan
- Weather station record includes each of the following at a minimum of four times per hour:
  - High and low temperature
  - Precipitation

- Humidity
- Wind speed and duration and direction
- Solar radiation.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- ☐ During implementation, ensure each irrigation water management device functions as intended.
- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- ☐ During implementation, monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data.
- ☐ After implementation, make the following documentation available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan and associated records.
    - Changes made to address distribution uniformity deficiencies.
    - Documentation demonstrating utilization of any sensor used throughout the growing season.

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements as it relates to implementing this enhancement, including applicable state specific job sheets.
- ☐ Prior to implementation, assist with data interpretations needed for management decision making.
- ☐ Prior to implementation, provide additional assistance to the participant as requested.

☐ After implementation, verify implementation of the irrigation water management plan by reviewing records kept during enhancement implementation.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449I

CONSERVATION STEWARDSHIP PROGRAM

IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation System

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

This enhancement consists of retrofitting an existing sprinkler irrigation system to integrate variable rate irrigation (VRI) speed control where the technology is not present. The added functionality of VRI speed control equipment allows for enhanced water application precision, efficiency, and uniformity along the length of the sprinkler irrigation system by varying the irrigation system speed within the irrigation pass. Renovation of the existing sprinkler irrigation system utilizing this enhancement includes the installation of an upgraded control panel capable of speed control programming and global positioning system (GPS) technology capable of providing real-time field position. Utilization of the VRI speed control and GPS equipment will be for the entire irrigation season and be based on spatially identified parameters such as variations in past yield data, soils, crop growth, topography, or computerized irrigation scheduling recommendations. This scenario requires that the existing sprinkler irrigation system meets Conservation Practice Standard (CPS) 442 uniformity and efficiency requirements. System equipment is installed in year 1 with this scenario and scenario E449G or E449C is used in years 2-5.

Criteria

- Documentation that ensures the speed control devices are compatible with the existing sprinkler irrigation system.
- Detailed drawings on how the speed control and GPS devices will connect to the existing sprinkler irrigation system, operate safely, and be protected.
- Irrigation water management (IWM) plan that follows the NRCS Conservation Practice Standard Irrigation Water Management (CPS449).
- The installation includes the purchase and installation of speed control and GPS devices. Components necessary for retrofit depend on the type of devices are installed and sprinkler irrigation system being renovated, but should consist of speed control and GPS devises as indicated below:

- Speed control unit with percentage timer setting capable of varying the irrigation system speed within the irrigation pass. Sprinkler irrigation tower speed is controlled by contactor coil voltage sent out by the percentage timer within the control panel.
- Satellite-guided GPS technology mounted on the sprinkler irrigation system provides real-time end tower location, speed, and direction information to the control panel.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Acquire an IWM plan meeting NRCS CPS Irrigation Water Management (Code 449) requirements.
- ☐ Develop a map delineating the location of the existing sprinkler irrigation system, speed control unit, satellite-based technology, and the fields they serve.
- ☐ Acquire NRCS approval of selected of selected speed control unit and satellite-based technology.

During implementation

- ☐ Ensure installation meets manufacturers recommendations.
- ☐ Provide documentation ensuring that the speed control device, GPS device, and supporting appurtenances allow the sprinkler irrigation system to operate safely and in the range of design operating conditions.
- ☐ Provide documentation of the protective structures meeting the requirements of the speed control and GPS devices. Ensure that the protective devices meet NRCS standards.
- ☐ Record each irrigation event, including the amount or depth of water applied, duration of the event, date of application, and any other requirements of the approved IWM Plan.

After implementation

- ☐ Copy of the record of each irrigation event, including the amount or depth of water applied, duration of the event, date of application, and any other requirements of the approved IWM plan.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement.
- ☐ Provide and explain NRCS Conservation Practice Standard Sprinkler System (Code442) as it relates to implementing this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Provided additional assistance to the participant as requested.

- ☐ Review and approve producer's selected equipment

During Implementation

- ☐ Provide additional assistance to the participant as requested.

After Implementation

- ☐ Verify installation of the speed control devices, GPS devices, and supporting appurtenances are in accordance with manufacturer's specification.
- ☐ Verify that speed control and GPS devices are compatible with the existing sprinkler irrigation system.
- ☐ Verify implementation of the approved IWM plan by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484A

Mulching to improve soil health

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health – increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical, and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least four different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Use plant-based mulching materials of suitable quantity and quality to add organic matter, provide food and shelter for soil biota, and protect the soil surface from raindrop impact and crusting while allowing for adequate soil aeration.
- Apply plant-based mulching materials with a carbon to nitrogen ratio (C:N) less than 30 to 1 to reduce soil nitrogen immobilization by soil biota (typical ratio examples – hairy vetch cover crop 11:1, fresh grass clippings 17:1, mature alfalfa hay 25:1, corn stalks 60:1, wheat straw 80:1, and pine needles 80-110:1).
- Do not apply mulch with C:N less than 20:1 to an area of designed flow in watercourses.

CONSERVATION STEWARDSHIP PROGRAM

- The crop rotation includes at least four crops and/or cover crops grown in a sequence.
- An evaluation of the system using the current approved SCI procedure results in zero or higher.
- Use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop. The crop rotation must include at least four crops and/or cover crops grown in a sequence.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Application Date

☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

CONSERVATION STEWARDSHIP PROGRAM

☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

☐ If changes were made to crop rotation or tillage operation(s) after implementation, complete the tables above to document the changes.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, verify that the crop rotation includes at least four crops and/or cover crops grown in a sequence.

☐ Prior to implementation, use information provided from the participant to calculate the Management SCI value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**

☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ If changes were made from the planned system after implementation, use information provided from the participant to calculate Management SCI value to document that the applied system met the enhancement criteria. **Management SCI Value = _____**

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484B

Reduce particulate matter emissions by using orchard or vineyard generated woody material as mulch

Conservation Practice: 484 Mulching

APPLICABLE LAND USE: Crop (perennial)

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Reduce particulate matter emissions by using orchard- or vineyard-generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. *An exception may be made when it is determined that infected material must be burned to preserve crop health.*

Criteria

- Non-infected, woody material will not be burned, but instead will be chipped and used as mulch. Infected material may be burned to preserve crop health, but 90% of all woody material must be mulched in order to count this enhancement as met.
- When mulching with wood products such as wood chips, bark, shavings, or other wood materials, apply a minimum two-inch thickness of particles that will remain in place during heavy rainfall or strong wind events, or both, if applicable.
- Mulching plan must be developed. Mulched material must meet guidelines laid out in a mulching plan for size of chips and thickness of cover applied.
- Mulch does not have to be applied to the immediate source area (orchard or vineyard), but instead may be applied anywhere needed on the operation that is designated in the mulching plan (e.g., other areas of farmstead or cropland).
- Avoid excessively thick or tightly packed mulches that can results in soggy, anaerobic conditions at the soil surface during wet weather or prevent rainfall or

overhead irrigation from reaching the soil during times of moisture deficit.

- Keep mulch three to six inches away from plant stems and crowns to prevent disease and pest problems. Additional weed control may be needed around the plant base area.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with information for review about current and proposed management of orchard or vineyard generated woody materials.

Field	Crop	Acres	Current Management	Proposed Management

☐ Prior to implementation, provide NRCS with the proposed mulching plan for development. NRCS can provide assistance, as needed, in plan development. At a minimum, the plan must include:

- Purpose of mulching
- Type of mulch material
- Approximate amount of mulch material to be utilized
- Size of mulch pieces (size range or maximum size of pieces)
- Placement timing (planned and actual)
- Depth of mulch cover
- Any required site preparation
- Operation and maintenance information
- Map(s) of area where material is to be applied

Field	Crop/Location	Mulching Material	Planned Mulching Depth or Rate of Application (inches or pounds/acre)	Planned Application Date

- ☐ During implementation, notify NRCS of any planned changes in the mulching plan to verify changes meet the enhancement criteria.

- ☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

- ☐ During implementation, take photos of area mulched that document the average size of mulched material and depth of layer applied.

- ☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Mulching Depth or Rate of Application (inches or pounds/acre)	Actual Application Date

- ☐ After implementation, provide mulching plan and photos for review of the area(s) mulched to document the average size of mulched material and depth of layer applied and to verify the planned system meets the enhancement criteria.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

- ☐ Prior to implementation, review current and proposed management of orchard- or vineyard-generated woody materials. *Plan/contract the actual acres of the crop producing the woody materials to be managed.*

- ☐ Prior to implementation, verify that the mulching plan meets all criteria of the enhancement.

- ☐ During implementation, evaluate any planned changes in the mulching plan to ensure enhancement criteria are met.

- ☐ If changes were made after implementation, use information provided from the participant to verify the applied system meets the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E484C

CONSERVATION STEWARDSHIP PROGRAM

Mulching with natural materials in specialty crops for weed control

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (annual & mixed), Crop (perennial)

RESOURCE CONCERN ADDRESSED: Plants

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Application of straw mulch or other state-approved natural material (such as wood chips, compost, green chop, dry hay, or sawdust) for weed control in specialty crops.

Criteria

Use mulch of sufficient ground cover, thickness, and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests. Mulch thickness will be determined by the size of the plant being mulched. Thickness of the mulch shall be adequate to prevent emergence of targeted weeds, but no less than four inches deep for dry mulches.

Grass-based green chop should be applied no greater than three inches deep as it will compact and rot. Add additional layers of green chop as decomposition occurs to maintain weed control. Do not use green chop from areas recently treated with herbicides.

Mulches shall be kept a minimum of three inches away from the stems of plants where disease is likely to occur. Depending on the crop, mulch distance may need to be up to six inches away from the stems.

Mulches applied around growing plants or prior to weed seedling development shall have 100%ground cover.

Avoid finely divided residues (e.g. sawdust) and those rich in soluble carbohydrates (e.g. fresh chopped corn or other grasses) with a carbon to nitrogen ratio (C:N) greater than 30 that tie up soil nitrogen (N) and necessitate supplemental N applications.

Avoid excessively thick or tightly packed mulches that can interfere with the movement of ground beetles and other beneficial organisms and may result in soggy, anaerobic conditions at the soil surface and increase the incidence of crop pests and diseases.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide a map showing location of mulch application.
- ☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that will provide weed suppression and do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Depth of Mulch (inches)	Planned Application Date

- ☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to ensure enhancement criteria are met.
- ☐ During implementation, take photos of mulch after application, during the growing season, and at harvest.
- ☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- ☐ During implementation, maintain all receipts or other records showing the quantity of mulch used.
- ☐ After implementation, provide NRCS with the applied mulching information and any additional information related to the mulching impacts on weed control or crop production.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify mulching materials to be used, depth of mulch, and quantity needed, and document on implementation requirements.
- ☐ Prior to implementation, use information provided from the participant to calculate the Management Soil Conditioning Index (SCI) value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**
- ☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to ensure enhancement criteria are met.
- ☐ After implementation, review the applied mulching information and records and recommend adjustments to the mulch specifications for subsequent years based on success of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E511C

CONSERVATION STEWARDSHIP PROGRAM

Forage testing for improved harvesting methods and hay quality

Conservation Practice 511 Forage Harvest Management

APPLICABLE LAND USE: Perennial cropland (hayland) and Pasture

RESOURCE CONCERN: Animals, Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Dry hay forage samples are collected and analyzed following LGU procedures. Analysis results are kept and used to improve harvest decisions to guide forage supplementation of on-farm livestock to meet nutritional needs and improve health and productivity.

Criteria

- This enhancement only applies to hay harvested on-farm.
- Develop a plan to harvest hay in a manner that protects stand longevity and maintains or improves forage quality. Plans must include specifications for harvest timing, handling prior to baling, and storage options to best preserve forage quality.
- At least **2 consecutive** cuttings will be required of the same forage type, but additional testing may be needed and should follow the Cooperative Extension or other specialist/nutritionists' recommendations and documented in the plan.
- Collect hay samples consistent with land grant university or accredited lab protocol for tissue sampling for each harvest cycle. Consult the National Forage Testing Association list of Certified Labs- https://www.foragetesting.org/links for more assistance.

CONSERVATION STEWARDSHIP PROGRAM

- Complete a record keeping document that will include all the following at a minimum for each cutting:
    - Date and time of harvest AND date of baling
    - Forage type
    - Maturity stage/description during harvest including harvest height
    - Curing and handling prior to baling (number of tedding, raking, and/or merging operations)
    - Moisture during harvest
    - Bale type (Large square, Round, Small Square)
    - Storage type (indoor, poly-wrapped, tubed, tarped, net wrapped, unprotected etc.)
    - Crude protein
    - Fiber (NDF/ADF)
    - Ash
    - Total Digestible Nutrients (TDN)
    - Relative feed value (RFV)
    - Additional recommended tests (where available): NDF-Digestibility (30-hour recommended) and nitrates.
- Provide record keeping documents and hay test results to NRCS office.
- Discuss results with local Cooperative extension educator or livestock nutritionist, provide any recommendations to NRCS office for all harvesting cycles.
- Use results to improve harvesting decisions.
- Use hay analyses to guide forage supplementation to on-farm livestock.

Adoption Requirements

This enhancement is considered adopted when the criteria is met, and documentation records are provided.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, develop a map delineating the fields selected for gathering the hay analysis and record keeping documentation.
- ☐ Prior to implementation, ensure forage harvesting tool/machinery is capable of cutting the forage at the desired residual height without compromising plant vigor and stand longevity.
- ☐ Prior to implementation, develop a plan to harvest hay in a manner that protects stand longevity and maintains or improves forage quality and maintains adequate stubble. Plans must include specifications for harvest timing, handling prior to baling, and storage options to best preserve forage quality. Refer to NRCS Conservation Practice Standard Forage Harvest Management (Code 511).
- ☐ Prior to implementation, provide the forage harvest and forage sampling plan to NRCS for review. Two consecutive cuttings of the same forage type will be evaluated, preferably on the same field, unless the first harvested species will be different than the second harvest on the same field, (for example cool season species fields that transition to warm season forage later in the season). The first cutting must be tested after harvest and is one of the two required. Management decisions must be made from the first test to determine how to improve forage quality for the next cutting. Record keeping should be completed for each cutting and a report completed. Additional testing may be needed and should follow the Cooperative Extension or other specialist/nutritionists' recommendations and documented in the plan.
- ☐ During implementation, collect the number of forage samples on mapped field/s during each harvest cycle and send to a land grant university or accredited lab for tissue analysis.
- ☐ During implementation, keep records including all items under criteria.
- ☐ During implementation, discuss results and implement technical recommendations from Cooperative Extension, nutritionist or NRCS.

- ☐ During implementation, use analysis results and data to improve/adjust forage harvesting activities for the next harvest cycle.

Example: Ash content above internal sources (calcium, magnesium, potassium, phosphorus); adjust cutting and/or rake heights to reduce external sources (dirt, bedding, etc.), use cutting heights and harvest timing to positively affect fiber level, change harvest timing to increase protein and NDF-d levels etc.

- ☐ During implementation use data collected from on-farm hay analysis to improve supplemental feeding periods for animals' health and productivity.
- ☐ After implementation, provide tissue analysis and all record keeping documentation to NRCS
- ☐ After implementation, provide technical recommendations from Cooperative Extension or other specialist/nutritionist to NRCS.
- ☐ After implementation, provide report on how the data enabled improvements to hay harvest and feed supplementation efficiency.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Forage Harvest Management (Code 511) as it relates to this enhancement.
- ☐ Prior to implementation, verify map and crop/hayfields where enhancement will apply.
- ☐ Prior to implementation, provide assistance in determining the forage cutting to be sent for analysis in addition to the required first cutting.
- ☐ Prior to implementation, provide assistance in determining the planned number of hay samples above the required 2.

- ☐ During implementation, verify management changes in harvest management have positively affected test values in the forage analysis results. Positive effects are but not limited to increases in crude protein levels, NDF-D and TDN values and/or lowering of NDF/ADF and Ash levels.

- ☐ After implementation, verify the hay harvest and hay analysis activities and record keeping meet the specifications of this enhancement.

- ☐ After implementation, review data driven report for hay harvest and supplemental feeding improvements.

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CONSERVATION ENHANCEMENT ACTIVITY

E528C

CONSERVATION STEWARDSHIP PROGRAM

Incorporating wildlife refuge areas in contingency plans for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

Criteria

- A written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife will be followed.
- Enhance diversity of rangeland plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
  - Clear objectives,
  - A resource inventory of structural improvements, existing resource conditions, and forage inventory.
  - Grazing plan, and

  - A contingency plan
  - A monitoring plan

- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Identify wildlife species of concern in the objectives of the prescribed grazing plan.
- An area that constitutes at least 15% of the planned enhancement acreage (or a minimum of ten acres, whichever is larger) that is predominantly native grasses and/or legumes and/or perennial forbs will be rested from all harvest by livestock or prescribed burning for a period of 12 months or longer.
- The rested area must be a grazing unit (or located in a grazing unit) that scores a minimum of 0.5 on the state NRCS Wildlife Habitat Evaluation Guide (WHEG).
- The rested area can be used to stockpile forages to build reserves for livestock forage after the 12-month rest period.
- In the event the designated refuge area gets utilized by livestock during a drought/disaster emergency or other contingency situation, during the life of the contract, it must be restored or let recover or another pasture designated and rested for 12 months following the emergency utilization.
- Water must be made available for the wildlife species of concern designated in the grazing plan in the refuge area or nearby where the refuge provides needed cover for water access.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, review NRCS Conservation Practice Standards Prescribed Grazing (Code 528) and Upland Wildlife Habitat Management (Code 645), including any state approved job sheets or work sheets.
- ☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
- ☐ Prior to implementation, provide locations of water access.
- ☐ Prior to implementation, obtain grazing/wildlife habitat management plan specifying what species the enhancement is targeting and how grazing management is being modified to benefit that species. The written grazing plan must describe the management and harvest of vegetation with grazing and/or browsing animals, what conditions create the need to implement a contingency plan, and what monitoring method(s) will be used.
    - o The grazing plan will include a minimum of a 12-month rest period on 15% of enrolled acres incorporated into grazing strategy. Supporting documentation identifying baseline conditions will be based on state NRCS Conservation Practice Standard Prescribed Grazing (Code 528) specifications.
- ☐ During implementation, keep actual use records (dates, time, and number of head).
- ☐ During implementation, maintain water in the refuge area or nearby where the refuge provides needed cover for water access.
- ☐ During implementation, collect monitoring data used to determine contingency activation such as precipitation, drought, fire, and flooding or forage availability.
- ☐ During implementation, consult with NRCS to adjust and adapt the plan to current conditions to verify the changes meet enhancement criteria. Changes to the plan will be documented in writing.
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
    - o Grazing/wildlife habitat management plan.
    - o Monitoring data and actual use records.

CONSERVATION STEWARDSHIP PROGRAM

- Any documented changes to the plan as result of contingency or monitoring data.

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standards Prescribed Grazing (Code 528) and Upland Wildlife Habitat Management (Code 645) as they relate to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern: _____
WHEG score before implementation: _____
WHEG score after implementation: _____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ After implementation, review actual use and monitoring data used to implement grazing strategy and provide recommendations for adjustments, or additional practices to facilitate future improvements in wildlife habitat.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation: _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528D

CONSERVATION STEWARDSHIP PROGRAM

Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range, Forest

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of rangeland plants, generally found on the Ecological Site Description or otherwise documented by measurement protocol, to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
  - Clear objectives
  - Resource inventory with ecological site description or reference sheet and structural improvements and existing resource conditions,
  - Grazing plan, and

CONSERVATION STEWARDSHIP PROGRAM

  - A contingency plan.

- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Identify species of concern in the objectives of the prescribed grazing plan.
- Plan intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the identified wildlife species.
- Evaluate wildlife habitat with the state NRCS Wildlife Habitat Evaluation Guide (WHEG) and manage for a WHEG value of 0.60 or greater.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, obtain a written grazing plan (NRCS can provide assistance as needed). Plan must include:

- Clear goals and objectives of the plan, including identification of the specie(s) of concern and the plant functional groups providing structure and composition.
- Contingency plan for events that trigger adverse results.
- Forage/Animal Balance.
- A grazing plan narrative describing the basis for when livestock movement or rotation will occur, including deferment plans.
- Contingency plans for forage shortfalls.
- Monitoring locations, key species, and monitoring techniques.
- Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

☐ During implementation, keep the following documentation:

- Livestock herd management records with seasonally important phenological stages of plant growth relative to species of concern.
- Annually complete a forage utilization worksheet, such as NRCS Conservation Practice Standard Prescribed Grazing (Code 528) job sheet.
- Grazing intensity records for all key grazing areas that accommodate the criteria.

☐ During implementation, consult with NRCS to adjust and adapt the grazing plan to current conditions to verify the changes meet enhancement criteria. Changes to the grazing plan will be documented in writing.

☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, complete an assessment of the site with NRCS using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern:_____
WHEG score before implementation:_____
WHEG score after implementation:_____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation:_____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E528E

CONSERVATION STEWARDSHIP PROGRAM

Improved grazing management for enhanced plant structure and composition for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range; Forest; Associated Ag Land

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand.
- Removal of herbage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants, and the nutritional needs of the animals.
- Deferment (non-grazing period less than one year) and/or rest (non-grazing period equal or greater than one year) will be planned for critical periods of plant needs (such as post-planting or renovation, severe drought, etc.).
- Manage grazing and/or browsing animals to maintain adequate cover on sensitive areas (such as riparian areas, wetlands, habitats of concern, karst areas, etc.)

CONSERVATION STEWARDSHIP PROGRAM

- Manage livestock movements based on rate of plant growth, available forage, and allowable utilization target. Develop and follow contingency plans to deal with episodic disturbance events.
- Both the specie(s) of concern and the plant functional groups providing structure and composition will be identified in the objectives of the prescribed grazing plan.
- Plan the intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the desired fish and wildlife species of concern.
- Manage the afore-mentioned aspects of grazing events to maintain a minimum score of 0.60 when evaluated with the state NRCS Wildlife Habitat Evaluation Guide (WHEG).

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, obtain a written grazing plan (NRCS can provide assistance as needed). Plan must include:

- Clear goals and objectives of the plan, including identification of the specie(s) of concern and the plant functional groups providing structure and composition.
- Contingency plan for events that trigger adverse results.
- Forage/Animal Balance.
- A grazing plan narrative describing the basis for when livestock movement or rotation will occur, including deferment plans.
- Contingency plans for forage shortfalls.
- Monitoring locations, key species, and monitoring techniques.
- Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

☐ During implementation, keep the following documentation:

- Livestock herd management records with seasonally important phenological stages of plant growth relative to species of concern.
- Annually complete a forage utilization worksheet, such as NRCS Conservation Practice Standard Prescribed Grazing (Code 528) job sheet.
- Grazing intensity records for all key grazing areas that accommodate the criteria.

☐ During implementation, consult with NRCS to adjust and adapt the grazing plan to current conditions to verify the changes meet enhancement criteria. Changes to the grazing plan will be documented in writing.

CONSERVATION STEWARDSHIP PROGRAM

☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, complete an assessment of the site with NRCS using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern: _____
WHEG score before implementation: _____
WHEG score after implementation: _____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ Prior to implementation, explain the functionality of this enhancement with Enhancement E314A, if sequentially applicable.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation: _____

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E528F

CONSERVATION STEWARDSHIP PROGRAM

Stockpiling cool season forage to improve structure and composition or plant productivity and health

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Associated Agricultural Land; Crop (Perennial); Crop (Annual and Mixed)

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

Criteria

Additions to the current Prescribed Grazing Plan must include:

- A record of designated paddocks and acreages to exclude grazing for a stated specified time period.
- The acreage needed for stockpiled forage will be predetermined.
- Stockpiled acreage will be supplied nutrients according to a land grant university approved soil test to achieve adequate forage growth at the beginning of the stockpiling period.
- Stockpile will be grazed in a manner that maintains specified minimum forage heights in the grazing plan to avoid damage to soil or forage.

CONSERVATION STEWARDSHIP PROGRAM

- Do not allow livestock to access previously grazed stockpiled areas when spring regrowth begins until recommended forage heights exist.
- The NRCS Conservation Practice Standard Prescribed Grazing (Code 528) must be followed on all pasture each year this enhancement is in effect. Note - leaving recommended residual forage heights, even though plants are dormant, are needed for erosion control and wildlife.
- Certification recorded that practice requirements have been met after grazing of stockpiled forages is complete before the new growing season begins.

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, develop a prescribed grazing plan including a plan map that delineates where forage stockpiling will occur. Make these materials available to NRCS for review.
- ☐ After implementation, make grazing records and photo documentation of stockpiling and level of use available to NRCS.

NRCS will:

- ☐ Prior to implementation, review grazing plan and maps provided by participant.
- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review records and photos provide to confirm adequate stockpiling and acceptable levels of grazing use.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528I

CONSERVATION STEWARDSHIP PROGRAM

Grazing management that protects sensitive areas-surface or ground water from nutrients

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

Criteria

- A written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife will be followed.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes: 1) Clear objectives, 2) A resource inventory including a forage inventory, structural improvements, and existing resource conditions, 3) Grazing plan, and 4) A contingency plan.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.
- Plan the intensity, frequency, timing and duration of grazing and/or browsing that will:
    - Minimize deposition or flow of animal wastes into water bodies or sinkholes,
    - Minimize animal impacts on stream bank or shoreline stability,
    - Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff, and
    - Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
- Livestock feeding and watering facilities will be located and designed/installed in a manner to improve livestock distribution and avoid overland flow to sensitive areas.
- When nutrients are applied on pastureland, soil testing and nutrient application will be done according to local land grant university guidance or the equivalent there of.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan that identifies the following:
  - The goals and objectives of the plan
  - Forage/Animal Balance
  - A grazing plan narrative describing the basis for when livestock movement or rotation will occur.
  - Contingency plans for forage shortfalls.
  - Monitoring locations, key species, and monitoring techniques.
  - A map identifying all permanent pastures, water sources, and any riparian area or other sensitive areas improved or maintained by this management.

- ☐ Prior to implementation, a nutrient management plan will be developed if nutrients will be applied. The nutrient management plan will detail appropriate soil testing protocol and acceptable nutrient application amounts.

- ☐ Prior to implementation, a copy of the competed grazing plan will be submitted to NRCS for review and approval.

- ☐ During implementation, consult with NRCS or a qualified grazing professional to adjust and adapt the grazing plan to current conditions. Changes to the grazing plan will be documented in writing.

- ☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ Prior to implementation, assist the participant with development of a grazing plan and/or nutrient management plan, as requested.

- ☐ Prior to implementation, review the plan(s) if not developed by NRCS.

- ☐ Prior to implementation, review soil test analysis

- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review written grazing records provided by the participant to determine if the grazing plan was adequately followed to protect or enhance riparian areas, wetland areas, or other sensitive areas.
- ☐ After implementation, review the nutrient management plan and application record to ensure nutrients were applied according to the plan.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528J

CONSERVATION STEWARDSHIP PROGRAM

Prescribed grazing on pastureland that improves riparian and watershed function

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes: 1) Clear objectives, 2) A resource inventory including a forage inventory, structural improvements, and existing resource conditions, 3) Grazing plan, and 4) A contingency plan.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.
- Manage grazing and/or browsing to provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation by moving livestock appropriately.
- Graze and rest pastures appropriately and with the right numbers, class, and kind of livestock to maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.
- If nutrients are applied, soil testing and nutrient application will be done according to local land grant university guidance or equivalent.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan that identifies the following:
  - Goals and objectives of the plan
  - Forage/Animal Balance
  - A grazing plan narrative describing the basis for when livestock movement or rotation will occur.
  - Contingency plans for forage shortfalls.
  - Monitoring locations, key species, and monitoring techniques.
  - Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

- ☐ Prior to implementation, a nutrient management plan will be developed if nutrients will be applied. The nutrient management plan will detail appropriate soil testing protocol and acceptable nutrient application tolerances.

- ☐ Prior to implementation, a copy of the developed grazing plan will be submitted to NRCS for review and approval.

- ☐ During implementation, consult with NRCS or a qualified grazing professional to adjust and adapt the grazing plan to current conditions. Changes to the grazing plan will be documented in writing.

- ☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ Prior to implementation, assist the participant with development of a grazing plan and nutrient management plan if requested to do so. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation.

- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review written grazing records provided by the participant to determine if the grazing plan was adequately followed to protect or enhance riparian areas, wetland areas, or overall watershed function.
- ☐ After implementation, if nutrients have been applied, soil testing and application records will be reviewed to determine if nutrients have been applied responsibly.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528L

CONSERVATION STEWARDSHIP PROGRAM

Prescribed grazing that improves or maintains riparian and watershed function-erosion

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range, Forest

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Criteria

- Must follow a written grazing plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
    - Clear objectives,
    - A resource inventory of structural improvements, existing resource conditions, and forage.
    - A monitoring plan
    - A contingency plan

- Supplemental feed or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.
- Manage grazing or browsing so as to provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Maintain adequate ground cover and plant density through monitoring to retain or improve filtering capacity of the vegetation by moving livestock appropriately.
- Adjust grazing strategy and rest as needed with the right numbers, class, and kind of livestock to maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan with:
  - o Inventory of structural improvements, existing resource conditions and forage
  - o Guidelines and recommendations for matching the forage quantity and quality produced with the grazing and/or browsing demand of livestock
  - o A contingency plan and
  - o A monitoring plan
- ☐ During implementation, keep pasture/herd in/out records and forage-animal balance sheet.
- ☐ During implementation, monitor riparian vegetation for use
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
  - o Written grazing plan
  - o Pasture/herd in/out records
  - o Documented utilization records
  - o Monitoring plan

NRCS will:

- ☐ As needed, provide technical additional assistance to the participant as requested.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement.

- ☐ After implementation, verify implementation of the written grazing plan, by reviewing plan and pasture/herd in/out records and forage-animal balance sheets kept during enhancement implementation.
- ☐ After implementation, review the monitoring plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____

Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528R

CONSERVATION STEWARDSHIP PROGRAM

Management Intensive Rotational Grazing

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN ADDRESSED: PLANTS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Criteria

- Management-intensive rotational grazing increases harvest efficiency of vegetation with grazing and/or browsing animals through smaller paddock sizes, higher stock density while maintaining plant residue with enough energy reserves to recover quickly when adequate soil moisture is available for regrowth.
- Must develop and implement a written grazing plan that:
  - increases stock density
  - shortens grazing periods
  - enhances plant recovery
  - matches the forage quantity and quality produced with the grazing and / or browsing animal, and

  - increases harvest efficiency and manure distribution by significantly increasing the existing stock density per herd.

- Removal of forage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants and the nutritional needs of the livestock.

- Deferment (non-grazing period less than one year) and / or rest (non-grazing period equal to or greater than one year) will be planned for critical periods of plant needs.

- Manage livestock rotation based on rate of plant growth, available forage, and allowable utilization target.

- Manage livestock rotation to provide adequate ground cover and plant density to decrease soil erosion, reduce runoff and improve infiltration and water holding capacity.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.

- Utilize higher stock density and shorter grazing periods in riparian areas to minimize impact to stream bank or shoreline stability and ensure other sensitive areas such as wetlands, habitats of concern, karst areas do not become degraded.

- Implement and maintain a rotational grazing system using a combination of permanent or temporary division fences and water facilities to serve the management needs of operation.

- Develop and follow contingency plans to deal with drought or flooding or other episodic disturbance events.

Develop and implement a monitoring plan that at a minimum evaluates livestock performance, plant community composition and density, and soil function components such as ground cover, infiltration and aggregate stability.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementing, obtain a grazing plan map delineating the existing paddock system, along with a livestock inventory (type, class, average weight, and number) to document the current stocking density and current stocking rate.
- ☐ Prior to implementation, acquire a prescribed grazing plan, with a plan narrative delineating the following:
    - The goals and objectives of the plan
    - Map showing the number of paddock subdivisions with water sources, proposed stock densities per paddock associated with different herds in the system.
    - Forage Inventory
    - Forage / Animal Balance
    - A grazing plan narrative describing the basis for when livestock movement or rotation will occur
    - A contingency plan
    - A monitoring plan
- ☐ During implementation, keep pasture/ herd in/out records, stock density records and photos of paddock condition and photos of high stock density grazing implementation.
- ☐ After implementation, provide the following items for review by NRCS:
    - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
    - Paddock / herd in / out records with actual stock densities documentation.
    - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
    - Changes made to the grazing management plan.

NRCS will:

- ☐ As needed, provide technical assistance to participant as requested.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) and supporting documents that are needed to implement this enhancement, such as forage-animal balance forms.
- ☐ Prior to implementation, review the existing grazing plan, maps and livestock inventory provided by the participant.
- ☐ Review the newly proposed grazing plan fencing and watering layout, associated maps and stock density numbers for each herd.
- ☐ After implementation, review the following:
  - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
  - Paddock / herd in / out records with actual stock densities documentation.
  - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
  - Changes made to the grazing management plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533A

CONSERVATION STEWARDSHIP PROGRAM

Advanced Pumping Plant Automation

Conservation Practice 533: Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation. These decisions should be made in conjunction with an irrigation water management plan. Field measuring devices may be part of the IWM plan, but additional devices can be installed as part of the enhancement such as water level, fuel level, pressure, or speed control sensors.

Criteria

- Documentation that ensures the control devices is compatible with the exiting pump station and irrigation system
- Detailed drawings of how the control device will connect to the existing pump station
- Protective structure/mechanism
- Irrigation water management (IWM) plan that follows the NRCS Conservation Practice Standard Irrigation Water Management (CPS449)
- Components necessary for automation depends on the type of pump installed, but both electric and combustible system should have a flow meter as indicated below:
    - Electrical power unit- flow meter with data logger and telemetry, necessary circuit boards and protections, VFD (if applicable), antenna, modem, housing, and other appurtenances as applicable

- Diesel power units- flow meter with data logger and telemetry, necessary circuit boards and protections, antenna, modem, housing, fuel use meter, and other appurtenances as applicable.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Completed IWM plan, documenting guidance and landowner decision using State specific protocol
- ☐ Map delineating the location of the installed pumping plants, soil moisture sensors, electronic water level sensors, pipeline networks, permanent flow meters and fields they serve. All components should be capable of telemetry
- ☐ Digital/Printed photography of installed components and GPS location

During implementation

- ☐ Provide documentation ensuring that the control device and supporting appurtenances allow the pumping station to continue to operate safely and in the range of designed operating conditions
- ☐ Provide documentation of the protective structure(s) meet the requirement of the control device and supporting appurtenances. Ensure that the protective structures meet NRCS standards
- ☐ Record each irrigation event, and daily soil moisture/water level (if applicable) throughout growing season.
- ☐ Apply irrigation water based on irrigation scheduling method selected to meet the crop's needs and maximize irrigation water efficiency.
- ☐ Measure and record the amount of water used to irrigate as it comes onto the farm and is applied to each field.

After implementation

- ☐ Copy of the record each irrigation event, and daily soil moisture/water level (if applicable), and rainfall throughout growing season.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement
- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code449) as it relates to implementing this enhancement
- ☐ Provided additional assistance to the participant as requested

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Review and approve producer's selected equipment

After Implementation

- ☐ Verify installation of the control device and all supporting appurtenances
- ☐ Verify that the control device is compatible with the pumping station and the range of operation condition
- ☐ Verify implementation of irrigation water management plan by reviewing records kept during enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533B

CONSERVATION STEWARDSHIP PROGRAM

Complete pumping plant evaluation for energy savings

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to reduce energy use. Evaluate to determine if a Variable Frequency Drive motor controller(s) will reduce energy use and is feasible.

Criteria

- Pump test evaluation will include all irrigation pumps on the on fields where the activity is implemented. There could be multiple pumps that are used on single or multiple fields.

- Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season.
  - Pressure at different flow rates based on partial or complete irrigations.
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated.
  - Estimate of friction loss in pipelines based on pressure drop in lines during test.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation:

- ☐ Provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.
- ☐ Arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.

During implementation

- ☐ Have a pump test evaluation performed on all irrigation pumps that service the fields where activity is implemented.

After implementation

- ☐ Make the following items available for review by NRCS to verify implementation of the enhancement:
  - Pump test evaluation report(s).
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation. Calculate the reduction of energy use based on before and after conditions. Energy savings can be reported as the average annual or seasonal energy reduction compared to previous operating conditions.

NRCS will:

Prior to implementation

- ☐ Provide and explain Pumping Plant (Code 533) to participant as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.

After implementation

- ☐ Verify pump test evaluation, by reviewing evaluation report.
- ☐ Verify energy savings based on system efficiency before and after implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533C

CONSERVATION STEWARDSHIP PROGRAM

Install VFDs on pumping plants

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in the evaluation.

Criteria

- Implement recommendations for components from a pumping plant evaluation where the FVD is feasible, reduces energy use, and the existing or new electric drive unit will support the VFD.
- The replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.
- Components of this enhancement will meet the NRCS Conservation Practice Standard Pumping Plant (Code 533).

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation:

- ☐ Review pumping plant evaluation, season of use, existing pump motor needs, and current operation.
- ☐ Evaluate site specific energy alternatives and net benefit of the Variable Frequency Drive(s).
- ☐ Ensure that energy utility provider has reviewed and approved location of installation on pump motor, including needs for electrical harmonic filter.
- ☐ Obtain written documentation of utility approval for site with requirements for installation.

During implementation

- ☐ Ensure installation meets federal National Electrical Code and any local or state codes.

After implementation

- ☐ Provide documentation of installation including first season energy use for comparison to prior years to NRCS for review to verify implementation of the enhancement.
- ☐ Monitor and maintain system for the life span of the practice (10 years).

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ Review with the participant the costs and benefits of the installation of Variable Frequency Drive(s).
- ☐ Develop written specifications describing site specific details of installation, including:
    - The replacement or retrofit system and/or related components or devices.
    - Baseline system energy usage and potential energy savings from the implementation of this enhancement.
    - Plan view showing the location of the measures in relation to other structures or natural features, where appropriate.
    - Electrical wiring that meets the requirements of the National Electrical Code.
    - Operation and maintenance plan that is consistent with the purpose(s) of this practice, its intended life, and safety requirements.

CONSERVATION STEWARDSHIP PROGRAM

After implementation

- ☐ Verify energy savings based on system efficiency before and after implementation of the enhancement

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

CONSERVATION ENHANCEMENT ACTIVITY

E533D

CONSERVATION STEWARDSHIP PROGRAM

Switch fuel source for pumps

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 15 years

Enhancement Description

Switch the fuel source for the pump motor(s) to an on-farm renewable source (wind, solar, geothermal, etc.).

Criteria

- Replace an existing pump motor with a drive unit that is powered by a renewable source such as wind, solar, geothermal, etc. that can adequately maintain the existing operating conditions, flow rates and pressures.
- The replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.
- Components of this enhancement will meet the NRCS Conservation Practice Standard Pumping Plant (Code 533).

Documentation and Implementation Requirements

Participant will:

Prior to implementation:

- ☐ Evaluate current operating conditions of the existing pump(s) including season of use and motor needs.
- ☐ Evaluate site specific renewable energy alternatives.
- ☐ Evaluate options during lack of production of renewable energy source.

During implementation

- ☐ Ensure installation meets federal National Electrical Code and any local or state codes.

After implementation

- ☐ Monitor and maintain system for the life span of the practice (10 years).

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ Review with the participant the costs and benefits of conversion to renewable energy source.
- ☐ Develop written specifications describing site specific details of installation, including:
  - ☐ The replacement or retrofit system and/or related components or devices.
  - ☐ Plan view showing the location of the measures in relation to other structures or natural features, where appropriate.
  - ☐ Method used to protect existing power provider from back feed from renewable source.
  - ☐ Electrical components that meet the requirements of the National Electrical Code.
  - ☐ Operation and maintenance plan that is consistent with the purpose(s) of this practice, its intended life, and safety requirements.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E580A

CONSERVATION STEWARDSHIP PROGRAM

Stream corridor bank stability improvement

Conservation Practice 580: Streambank and shoreline protection

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Range; Forest; Farmstead; Associated Ag Land

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 20 years

Enhancement Description:

Stream corridor bank vegetation components are established to provide additional stream corridor bank stability.

Criteria:

- This enhancement can be applied to streambanks and adjacent floodplain/riparian area of natural channels where the channel is susceptible to erosion and migration.
- Stream corridor vegetative components must be established as necessary for ecosystem functioning and stability. The appropriate composition of vegetative components is a key element in preventing excess long-term channel migration in re-established stream corridors.
- Dominant vegetation will consist of existing, naturally-regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site. Vegetation established on channel banks and adjoining areas must be in accordance with NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- Vegetation cover that promotes sediment deposition should be used to help floodplain development and growth. Overland flow should be maintained as sheet flow through the adjacent floodplain/riparian area to prevent erosion and promote sediment deposition.

- Utilize vegetative species that are native and/or compatible with local ecosystems. Avoid introduced, invasive, noxious or exotic species that could become nuisances. Where possible, select plant materials that also provide habitat requirements for desirable wildlife and pollinators.
- Treatments should meet aesthetic and recreational objectives as determined by a site-specific assessment or management plan. Aesthetic objectives should be based on human needs, including visual quality, noise control, and microclimate control. Treatments should be designed to achieve recreation objectives as determined by a site-specific assessment or management plan. Safety requirements shall be based on type of human use and recreation objectives.
- Construction materials, grading practices, and other site development elements must be selected and designed to be compatible with adjacent land uses.
- Livestock exclusion must be considered during establishment of vegetative treatments and appropriate grazing practices applied after establishment to maintain plant community integrity. Wildlife may also need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.
- Design the stream corridor and bank vegetation enhancement for an expected life of at least 20 years. Protective treatments must be self-sustaining or require minimum maintenance.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, prepare the planned acres for tree or shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342). (NRCS will provide technical assistance, as needed.)

☐ Prior to implementation, select a combination of deep-rooted trees and shrubs appropriate for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration. If possible, select plant materials that also provide habitat for desirable wildlife and pollinators (NRCS will provide technical assistance, as needed.)

Species / Type	Number	Wildlife habitat characteristic(s), if any

☐ Prior to implementation, select arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

TASKS	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____
Planting Date					
Planting Technique					
Arrangement/Spacing					

☐ During implementation, use erosion control methods based upon specifications developed for the site.

☐ After implementation, protect the area from livestock until vegetation is well-established, and, if necessary, control wildlife access within state and local regulations.

☐ After implementation, conduct inspections after high flows and undertake prompt actions if there is excessive streambank or streambed instability or erosion.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately graded and prepared for tree and shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342).
- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.
- ☐ As needed, prior to implementation, NRCS will provide technical assistance for:
  - Selecting a combination of appropriate, deep-rooted tree and shrub species for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration.
  - Selecting appropriate arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions.
  - Planning the use of additional erosion control, as needed for the site.
  - Preparing specifications for applying this enhancement using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify the planned trees and shrub species were established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from livestock and, as necessary, from wildlife.
- ☐ After implementation, verify planned erosion control provided by the site is functioning and is maintained to specifications developed for the site.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E580B

CONSERVATION STEWARDSHIP PROGRAM

Stream corridor bank vegetation improvement

Conservation Practice 580: Streambank and shoreline protection

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Range; Forest; Farmstead; Associated Ag Land

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 20 years

Enhancement Description

Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

Criteria

- This enhancement can be applied to streambanks and adjacent floodplain/riparian area of natural channels where the channel is susceptible to erosion.
- Stream corridor vegetative components shall be established as necessary for ecosystem functioning and stability. The appropriate composition of vegetative components is a key element in preventing excess long-term channel migration in re-established stream corridors.
- Establishment of vegetation on channel banks and associated areas shall also be in accordance with NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- Utilize vegetative species that are native and/or compatible with local ecosystems. Avoid introduced, invasive, noxious or exotic species that could become nuisances.
- Select plant materials that provide habitat requirements for desirable wildlife and pollinators.

- Treatments shall be designed to achieve habitat and population objectives for fish and wildlife species or communities of concern as determined by a site-specific assessment or management plan. Objectives shall be based on the survival and reproductive needs of populations and communities, which include habitat diversity, habitat linkages, daily and seasonal habitat ranges, limiting factors and native plant communities.
- The type, amount, and distribution of vegetation shall be based on the requirements of the fish and wildlife species or communities of concern to the extent possible.
- Treatments shall be designed to meet aesthetic objectives as determined by a site-specific assessment or management plan. Aesthetic objectives shall be based on human needs, including visual quality, noise control, and microclimate control.
- Construction materials, grading practices, and other site development elements shall be selected and designed to be compatible with adjacent land uses.
- Treatments shall be designed to achieve recreation objectives as determined by a site-specific assessment or management plan. Safety requirements shall be based on type of human use and recreation objectives.
- Livestock exclusion shall be considered during establishment of vegetative treatments and appropriate grazing practices applied after establishment to maintain plant community integrity. Wildlife may also need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.
- Design the stream corridor and bank vegetation enhancement for an expected life of at least 20 years.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, prepare the planned acres for tree or shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342). (NRCS will provide technical assistance, as needed.)
- ☐ Prior to implementation, select a combination of deep-rooted trees and shrubs appropriate for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration. These plant materials should also provide habitat for wildlife, pollinators, and fish species as determined by a site-specific assessment or management plan (NRCS will provide technical assistance, as needed.)

Plant Species / Type	Number	Planted for what wildlife, pollinators, fish:

- ☐ Prior to implementation, select arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

TASKS	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____
Planting Date					
Planting Technique					
Arrangement/Spacing					

- ☐ During implementation, use erosion control methods based upon specifications developed for the site.
- ☐ After implementation, protect the area from livestock until vegetation is well-established, and, if necessary, control wildlife access within state and local regulations.
- ☐ After implementation, conduct inspections after high flows and undertake prompt actions if there is excessive streambank or streambed instability or erosion.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately graded and prepared for tree and shrub establishment. Refer to NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.
- ☐ As needed, prior to implementation, NRCS will provide technical assistance:
  - ○ Developing a Wildlife Habitat Management Plan for targeted suite of species.
  - ○ Meeting with participant to review the Wildlife Habitat Management Plan and plan and specifications.
  - ○ Selecting a combination of appropriate, deep-rooted tree and shrub species for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration and achieving habitat and species objectives.
  - ○ Selecting appropriate arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions.
  - ○ Planning the use of additional erosion control, as needed for the site.
  - ○ Preparing specifications for applying this enhancement using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify the planned trees and shrub species were established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from livestock and, as necessary, from wildlife.
- ☐ After implementation, verify planned erosion control provided by the site is functioning and is maintained to specifications developed for the site.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E590C

CONSERVATION STEWARDSHIP PROGRAM

Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Conservation Practice 590: Nutrient Management

APPLICABLE LAND USE: Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

Criteria

- Documentation of producer's record of nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- For nitrogen (N), phosphorus (P), and potassium (K), plan application rates using land grant university (LGU) recommendations or industry practices when recognized by the LGU. Lower-than-recommended nutrient application rates are permissible if the client's objectives are met.
- Geo-referenced map of all current and planned hay feeding areas, watering facilities, shelters, or other potential areas of animal concentration.

CONSERVATION STEWARDSHIP PROGRAM

- Minimize soil surface disturbance during fertilizer placement.
- **Utilize two or more nutrient use efficiency strategies or technologies** to reduce nutrient loss risk and improve nutrient use efficiency. Select two or more of the strategies and technologies below:
    - Split nutrient applications.
        - Apply no more than 50% of total forage N needs before green up of dormant grasses. Apply the remaining N after green up.
        - Additional nitrogen applications may be reduced or eliminated based on forage scouting, in-season soil sampling/analysis, or plant tissue sampling/analysis.
    - Nutrient application placement below soil surface.
        - Nutrients are injected or incorporated using a minimal soil disturbance method at time of application.
    - Use variable rate technology for all nutrient applications. Variable rate technology may be map-based, sensor-based (crop canopy sensors), or manual. Requires the development of site-specific production maps using soils data, current soil test results, or a productivity monitoring system with GPS to correlate field location with productivity. Data is used to diagnose low, medium, and high productivity areas (pasture management zones).
    - Movement of hay feeding locations to distribute nutrients across the pasture(s) to avoid areas of nutrient concentration and sensitive areas. Develop a detailed hay feed movement plan, which includes soil sampling of the historic/current hay feeding areas and planned areas to assess status of soil nutrients. Monitoring required through annual soil sampling, geo-references photographs, and written records.
    - Adjust pH to the optimum level for legumes and forages. Apply soil amendments to adjust soil pH according to soil test recommendations. Monitoring required through

annual soil sampling. *This option is only applicable on fields with documented need and having existing stands of forage species that do not need re-establishment.*

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide documentation for review by NRCS showing a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- ☐ Prior to implementation, develop and document a planned nutrient budget, forage production goal, and applications (pounds/acre active ingredient, nutrients must include at a minimum N-P-K). *If variable rate technology will be used develop site-specific yield maps and use them to develop management zones within the pasture.*
- ☐ Prior to implementation, develop geo-referenced maps showing location of current areas of livestock concentration.
- ☐ Prior to implementation, select two or more of the nutrient use efficiency strategies or technologies. **Selections:** _____
- ☐ During implementation, keep records to document actual nutrient applications (pounds/acre active ingredient, nutrients must include at a minimum N-P-K).
- ☐ During implementation, minimize soil surface disturbance during fertilizer placement.
- ☐ During implementation, notify NRCS of any planned changes to verify the planned system meets the enhancement criteria.
- ☐ During implementation, additional record keeping requirements for specific strategy or technology:
    - Nutrient application placement below soil surface. Records and documentation must include method of injection or incorporation and depth.

- Variable rate technology. Keep records to document as applied records of actual variable rate applications (maps and/or tabular statistics).
- Monitoring of hay feeding location movement. Maintain annual soil sample results, geo-references photographs, and written records.
- Adjust pH. Maintain soil test results.

☐ After implementation, make documentation and records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Nutrient Management (CPS 590) as it relates to implementing this enhancement.

☐ Prior to implementation, review documentation to verify a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.

☐ Prior to implementation, verify the development of a planned nutrient budget, yield goal, and planned nutrient applications. *If variable rate technology will be used, verify the development of site-specific yield maps used to develop management zones within the field.*

☐ Prior to implementation, verify the selection of two or more nutrient use efficiency strategies or technologies.

☐ During implementation, evaluate any planned changes to verify the planned system meets the enhancement criteria.

☐ After implementation, review documentation and records to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E595A

CONSERVATION STEWARDSHIP PROGRAM

Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Conservation Practice 595: Integrated Pest Management

APPLICABLE LAND USE: Crop (annual & mixed); Crop (perennial)

RESOURCE CONCERN ADDRESSED: Water Quality Degradation

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

Criteria

- Documentation of producer's record of integrated pest management meeting all Conservation Practice Standard Integrated Pest Management (CPS 595) general criteria
- Use of GPS or other geospatial technologies is required to document application and site-specific compliance with all label requirements for controlling non-target application.
- Utilize one or more of the following techniques to reduce the total amount of chemical applied and reduce the potential for delivery of chemicals into water bodies:
    - Precision guidance system which reduces ground or aerial spray overlap to less than 12 inches

- Variable rate technology (VRT) which allows rate of pesticide application to dynamically change for site specific applications
- "Smart sprayer" technology which utilizes automatic sensors and computer controlled nozzles to turn individual nozzles on and off

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide documentation of implementation of integrated pest management meeting all Conservation Practice Standard Integrated Pest Management (CPS 595) general criteria and additional criteria to prevent or mitigate off-site pesticide risks to water quality from leaching, solution runoff, and adsorbed runoff losses.
- ☐ During implementation, keep records of applications using the selected technology with maps and/or tabular data.
- ☐ After implementation, make the following items available for review by NRCS to verify implementation of the enhancement:
  - As applied records of actual applications using the selected technology (maps and/or tabular statistics).

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Integrated Pest Management (CPS 595) as it relates to implementing this enhancement.
- ☐ As needed, provide technical additional assistance to the participant as requested.
- ☐ After implementation, verify implementation of the enhancement, by reviewing records created during enhancement implementation.

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Acres Applied _____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E644A

CONSERVATION STEWARDSHIP PROGRAM

Managing Flood-Irrigated Landscapes for Wildlife

Conservation Practice 644: Wetland Wildlife Habitat Management

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

Criteria

- Develop a conservation plan for the targeted species suite.
- As identified in the conservation plan, flood-irrigation will be applied in an amount and at a time to meet the targeted wildlife need.
- States will apply general criteria from the NRCS National Conservation Practice Standard Wetland Wildlife Habitat Management (Code 644) and additional criteria as required by the NRCS State Office
- Targeted species must be listed on the State Wildlife Action Plan or as State Endangered, State Threatened, State Sensitive (or similar designation).
- Appropriate locations for this enhancement will be provided by the NRCS State Office (NRCS State Office will base locations on current distribution of the targeted species and potential expansion into adjacent habitat for the target species. Other agencies

(e.g. State Department of Fish and Game, USFWS) and organizations (e.g. Ducks Unlimited, The Nature Conservancy) will provide input to NRCS concerning instances where the enhancement is used to provide habitat outside of the current distribution of the target species.)

- Use of fertilizers, pesticides, and other chemicals shall not compromise the intended purpose of this practice.
- Use criteria in other NRCS Conservation Practice Standards to facilitate the management of wetland wildlife habitat as appropriate for the site.
- Depending on site conditions, facilitative practices may be used to implement this enhancement. The NRCS Conservation Practice Standards may include, but are not limited to: Dam, Diversion (Code 348), Diversion (Code 362), Fence (Code 382), Field Border (Code 386), Filter Strip (code 393), Grade Stabilization Structure (Code 410), Irrigation Canal or Lateral (Code 320), Irrigation Field Ditch (Code 388), Irrigation Pipeline (Code 430), Irrigation Storage Reservoir (Code 436), Irrigation System, Surface and Subsurface (Code 443), Irrigation Water Management (Code 449), Nutrient Management (Code 590), Pumping Plant (Code 533), Riparian Herbaceous Cover (Code 390), Shallow Water Development and Management (Code 646), Stream Crossing (code 578), Structure for Water Control (Code 587), and Wetland Enhancement (Code 659).
- A Wildlife Habitat Evaluation Guide (WHEG) specific to wildlife habitat within a flood-irrigated landscape on perennial cropland or pasture must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than or equal to 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Digital photographs documenting the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, provide and explain state NRCS Conservation Practice Standard Wetland Wildlife Habitat Management (Code 644) as it relates to implementing this enhancement.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement; **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant, and discuss range of management alternatives that would improve wildlife habitat conditions
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, review and explain the Wildlife Habitat Management Plan to the participant.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**

☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646A

CONSERVATION STEWARDSHIP PROGRAM

Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

ENHANCEMENT LIFE SPAN: 5 years

Enhancement Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

Criteria:

This enhancement applies to crop land use acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures that affect applicable fields will be closed by mid-fall and remain closed through February 15. For fields where harvest of the crop occurs after mid-fall (e.g., ratoon rice), structures must be closed within 2 days following harvest and remain closed through February 15.
- Applicable fields must be flooded to an average depth of 6 to 18 inches.
  - Water depths of 6 to 10 inches provide maximum benefit to targeted species.
  - Water depths shall not exceed 18 inches for any extended period.

- Manipulation can occur prior to holding water. Manipulation should not affect more than 80 percent of the field to which the activity is applied.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be paired with E647A - Manipulate vegetation on fields with captured rainfall for waterfowl and wading bird winter habitat. If not paired with E647A, this Enhancement may also be paired with E646C – Manipulate vegetation and maintain closed structures for shorebird mid-summer habitat or E646D – Manipulate vegetation and maintain closed structures for shorebird late summer habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure all water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review the results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified, to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened
  - o Digital photographs documenting the condition of the structures and the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify the enhancement will be applied to cropland acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement. **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with the participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using the Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review completed field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646B

CONSERVATION STEWARDSHIP PROGRAM

Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. In addition, flooded conditions promote establishment of aquatic invertebrate populations, a protein-rich food source for shorebirds as well as waterfowl and wading birds. Flooded conditions across the broader landscape promote a network or continuity of habitat that is available to migratory waterfowl and wading birds. Benefits may become greatest during late winter and early spring as birds are assimilating nutrient and fat reserves in preparation for northward migration. However, agricultural fields flooded during fall-winter are typically drained during late January or February in advance of spring planting. This often results in a rapid reduction in available habitat and may constrain ability of migratory birds to adequately prepare for migration, with greatest impacts likely occurring during years of low winter precipitation. Retention of water on agricultural lands into early spring will produce maximum benefits to migratory waterfowl and shorebirds by providing high quality habitat during a time when habitat may otherwise be in low abundance.

Criteria:

This enhancement applies to crop land use acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures affecting the subject land use are to be closed by mid-fall and remain closed until late winter to early spring.
    - Water depths of 6 to 10 inches provide maximum benefit to targeted species.
    - Water depths shall not exceed 18 inches for any extended period.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be grouped with E647A - Manipulate vegetation on fields with captured rainfall for waterfowl and wading bird winter habitat. If not grouped with E647A, this Enhancement may also be grouped with E646C – Manipulate vegetation and maintain closed structures for shorebird mid-summer habitat or E646D – Manipulate vegetation and maintain closed structures for shorebird late summer habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified in order to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain a field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened
  - o Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess the habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement; **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review the results of the wildlife habitat evaluation with the participant, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646C

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Criteria:

This enhancement applies to crop land use acres with leveed fields that are capable of holding 8 to 18 inches of water in early spring, can retain that water until July 31 and will have less than 25 percent woody cover.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures affecting the subject land use acre are to remain closed catching and holding all available precipitation, until mid-summer (i.e. July 31).

- Sites must contain 8 to 18 inches of water.
- Manipulate vegetation on the site, if after late spring to early summer, the site becomes dry with emergent vegetation covering 50 percent or more, at a height of 6 inches or more. Manipulate by rolling or disking to bring the majority (75 percent or more) of the vegetation at or below the soil surface. Rolling is the preferred method of manipulation to maintain soil quality.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

  Note: This Enhancement may be grouped with E646B – Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified in order to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain a field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened;
  - o Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding 8 to 18 inches of water in early spring, can retain that water until July 31 and will have less than 25 percent woody cover.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement; **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using the Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646D

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation and maintain closed structures for shorebird late summer habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Criteria:

This enhancement applies to crop land use acres with leveed fields that are capable of holding 8 to 18 inches of water mid-spring with capabilities for retaining that water until August 31, and will have less than 25 percent woody cover.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures are to remain closed in order to catch and hold all available precipitation until late-summer (i.e., August 31).

- Sites must contain 8 to 18 inches of water.
- Manipulate vegetation on the site, if after June 15, the site becomes dry with emergent vegetation covering 50 percent or more, at a height of 6 inches or more. Manipulation by rolling or disking to bring the majority (75 percent or more) of the vegetation at or below the soil surface. Rolling is the preferred method of manipulation to maintain soil quality.
- The need for vegetative manipulation will be triggered by the above stated scenario. However, multiple manipulations may be needed to achieve the desired habitat response.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be grouped with E646B - Extend retention of captured rainfall for waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain the field log to include:
  - Crops grown and the harvest date for the crops grown on the applicable acres;
  - Date/time the water control structure was closed;
  - Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - Date/time when the water control structures were opened;
  - Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding 8 to 18 inches of water mid-spring with capabilities for retaining that water until August 31, and will have less than 25 percent woody cover.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement; **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop the Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number_____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647A

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

ENHANCEMENT LIFE SPAN: 5 years

Enhancement Description:

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units, especially in the Gulf Coast and Central Valley of California. When flooded to shallow depths during fall and winter, these agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

Criteria:

CONSERVATION STEWARDSHIP PROGRAM

This enhancement applies to crop land use acres with leveed fields that contain robust vegetation (e.g., post-harvest rice stubble, annual grasses and sedges) and are capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the suite of species targeted.
- Manipulation vegetation by either lightly disking or bush hogging or rolling the majority (50-80 percent) of the contracted acres during early to late fall.
    - For fields where harvest of the crop occurs later (e.g., ratoon rice), manipulation must be conducted within 7 days following harvest.
    - Manipulation shall not be done in a large, continuous block. Strip disking and/or mowing in mosaic or other irregular patterns is required.
    - Manipulation can occur prior to or during the water holding period, but manipulation must not affect greater than 80 percent of the field.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be paired with E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat or E646B – Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain a field log to include:
  - Crops grown and the harvest date for the crops grown on the applicable acres;
  - Date/time and description of all habitat management actions taken;
  - Digital photographs documenting the condition of the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop acres with leveed fields that contain robust vegetation (e.g., post-harvest rice stubble, annual grasses and sedges) and are capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647C

CONSERVATION STEWARDSHIP PROGRAM

Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN ADDRESSED: Animal

ENHANCEMENT LIFE SPAN: 5 year

Enhancement Description:

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

Criteria:

This enhancement applies to cropland acres on soils that are hydric and/or significantly water saturated during the growing season and are located on the low side or down slope portion of a field that receives hydrologic surface flow from the remainder of the field. Surface flow could be a result of irrigation or rainfall. Selected areas should be capable of being flooded using a water control structure or other means.

- Develop a habitat management plan targeting waterfowl, shore birds and wading birds for the area enrolled under this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- Maintain naturally occurring vegetation on the appropriate, selected area (minimum 20 feet wide and 500 feet long) to provide forage and cover for waterfowl, shorebirds and wading birds.
- Manipulation (light disking, burning, mowing, or rolling) of the selected area will be allowed during early fall to increase attractiveness and use by targeted species. Otherwise, all mechanical disturbance and chemical treatments shall be excluded from the selected area and care should be taken to ensure that the area is not impacted by agricultural operations in the adjacent crop.
- Control of invasive species may be allowed with approval from local NRCS staff.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review Wildlife Habitat Management Plan.
- ☐ During implementation, follow Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time and description of all habitat management actions taken;
  - o Digital photographs documenting the condition of the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop acres on soils that are hydric and/or significantly water saturated during the growing season and are located on the low side or down slope portion of a field that receives hydrologic surface flow from the remainder of the field. Surface flow could be a result of irrigation or rainfall. Selected areas should be capable of being flooded through the use of a water control structure or other means.
- ☐ Prior to implementation, assess habitat condition using Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions
- ☐ Prior to implementation, develop Wildlife Habitat Management Plan for targeted suite of species
- ☐ Prior to implementation, meet with participant to review Wildlife Habitat Management Plan

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647D

CONSERVATION STEWARDSHIP PROGRAM

Establish and maintain early successional habitat in ditches and bank borders

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 5 year

Enhancement Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

Criteria:

This enhancement applies to crop, pasture, or range land use acres with existing ditches and ditch borders where adequate naturally occurring vegetation is not present.

- Develop a wildlife habitat management plan for the suite of species targeted.
- Allow ditches and bank borders to re-vegetate to naturally occurring vegetation.

- Ditch borders will be a minimum of 20 feet wide and a maximum 60 feet wide.
- In circumstances where woody vegetation exists immediately adjacent to a farm ditch (e.g., such as along a spoil bank), an adjoining minimum 20 feet early successional, native vegetative border will also be established.
- Once established, ditches and borders may not be treated more than once every two years and may not be mowed, disked, grazed, dredged, cleaned, or sprayed with broadcast herbicides, or otherwise disturbed between treatments.
- Encroaching undesired woody vegetation may be controlled between the two treatment periods through spot spraying with approved herbicides.
- For the two approved treatments, light disking, mowing or herbicides may be used to control vegetation next to designated ditches, along ditch banks and borders.
    - These treatments must be applied outside of the primary wildlife ground nesting season.
    - Only herbicides approved for appropriate site conditions shall be applied.
    - Herbicides shall be applied following manufacturers label requirements.
- Grazing is not permitted unless a grazing management plan is in effect.
- Multiple ditch borders on the same property must have varying maintenance schedules.
- Invasive species such as kudzu, cogongrass, Chinese tallow tree, etc. that may become established in the border area must be controlled by spot spraying with an approved herbicide.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland, must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Type of crop(s) grown.
  - o Harvest date of crops grown on the applicable acres.
  - o Date/time and description of all habitat management actions taken.
  - o Digital photographs documenting the condition of the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop, pasture, or range acres with existing ditches and ditch borders where adequate naturally occurring vegetation is not present.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with the participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with the participant to review the Wildlife Habitat Management Plan.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E666A

Maintaining and improving forest soil quality.

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Soil, Air

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

Criteria

- States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.
- Update or modify the Forest Management Plan to include the following guidelines for forest soil quality management, as appropriate for the site.
    - Limit the area of compacted soils
        - Operate equipment on established roads and trails and minimize travel into the general forest area
        - Operate equipment on woody debris (slash) in areas with sensitive or wet soils
        - Sequence forest management activities (back to front) to limit the number of equipment passes

- Use smaller and lighter equipment, track equipment, low PSI tires, and lighter loads. Where appropriate, use mules, draft horses or other animals for moving harvested trees
- Restore heavily compacted areas (e.g., by sub-soiling or other mechanical method)

o Limit impacts of roads and landings

- Avoid disturbing natural drainage channels (e.g., design road locations to minimize stream crossings and diversions)
- Roads and landings occupy 5% or less of total wooded acreage
- Establish cover on roads and landings that are not in use

o Limit soil disturbance and control erosion

- Avoid disturbing forest litter and the soil surface
- Protect roads using water bars/rolling dips
- Establish cover on disturbed areas
- Retain downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention

o Maintain favorable conditions for forest growth

- Control the amount of road use, and off-road travel, to prevent erosion, compaction, and disturbance of the soil surface
- Establish cover on any disturbed areas
- Monitor the forest area for signs of insect damage, tree diseases, invasive plants, or other impacts on forest growth and health

o Retain and enhance carbon storage to support soil ecologic functions

- Follow stocking guidelines to maintain tree canopy cover (i.e., between the A and B lines of stocking guides at a minimum; preferably closer to the A line). See the stocking chart shown below.
- Add woody material to the soil by girdling or cutting non-merchantable trees or trees of undesired species
- Use extended rotations to keep carbon on the site for a longer period

CONSERVATION STEWARDSHIP PROGRAM

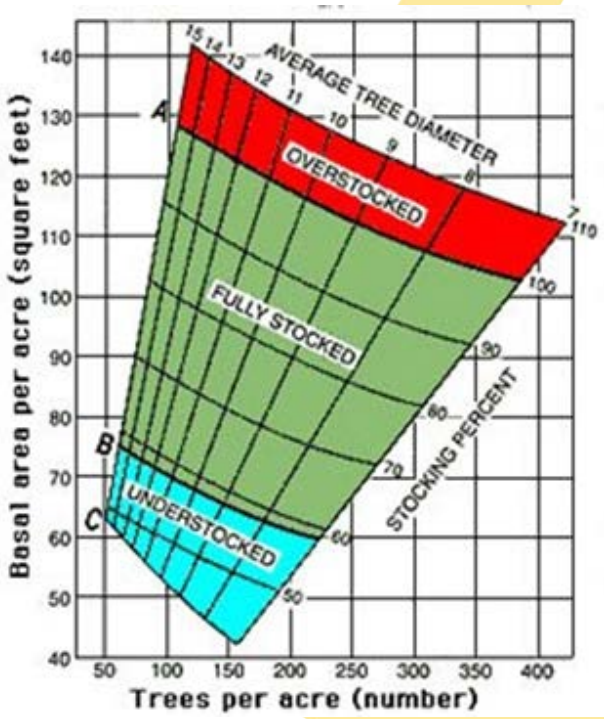
- Retain fallen trees, branches, snags, downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention, in quantities as specified below, or by the NRCS State Office.
  - For western conifer forests, maintain coarse woody residue:
    - that is greater than 3" in diameter,
    - left lying on the soil surface, and
    - which meets the post-harvest target levels of the following chart:

	Habitat Type	Target tons per acre of coarse woody debris
Dry Forests	Ponderosa pine types	5-13 tons/acre
⇕	Douglas-fir types	7-14 tons/acre
	Grand fir types	7-14 tons/acre
Moist Forests	Western hemlock types	16-33 tons/acre

- Maintain soil productivity by soil testing and fertilization if needed (including options for fertilizing with manure, biochar, or other organic materials).
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/ stocking guides.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.

- Refer to WIN-PST criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) and comply with applicable State and local laws if an herbicide will be used.
- Time tree girdling or felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) to protect soil and site resources from vehicle impacts. Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.

Figure 1: Stocking Chart *showing tree size and density scales indicating when forests are overstocked (too crowded), fully stocked (providing good growth), and understocked (trees do not fully utilize the site). Stocking guides were developed by Gingrich (1967).*



CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- ☐ Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard or appropriate state Job Sheet and use this information to meet the criteria of this enhancement.

- ☐ Prior to implementation, have a current or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for rehabilitating existing soil resource damage including compaction, ruts, puddling, erosion, downslope soil movement, exposed mineral soil, and depletion of the forest floor. It will also address rehabilitation for any water resource concerns such as diverted streams or intermittent flows. It will assess road layout and provide guidance on practices to correct any erosion or hydrologic impacts. Have the FMP available for NRCS review.

- ☐ Prior to implementation, arrange for soil tests to be conducted, one per each five acres. The FMP will include guidance for correcting any significant nutrient deficiencies.

- ☐ Prior to implementation, arrange for a forestry specialist to evaluate the stand and perform site-specific marking of areas to be seeded with cover plantings, locations where water control is needed, and trees that are to be girdled for snag creation.

- ☐ Prior to implementation, be aware of the state's Forestry Best Management Practices (BMP's) so they can be followed to protect the site and maintain soil and water quality.

- ☐ Prior to implementation, be aware of the current stocking level of trees on the site and the target level of stocking to maintain as part of this enhancement. This information should be detailed in the Forest Management Plan.

- ☐ During implementation, maintain the stand in a fully stocked condition using the appropriate stocking chart, between the A and B lines (see figure 1). The target stocking level should be between the A and B line, but closer to the A line.

- ☐ During implementation, follow state BMP guidelines and any additional guidance from the NRCS State Office to protect trails, roads and landings from soil loss or damage. Re-vegetate these disturbed areas or close them off to traffic to allow natural vegetation to grow on these areas.

- ☐ During implementation, spread tops and limbs across the site during any tree reduction operations to protect the soil.
- ☐ After implementation, provide the following information to NRCS; dates completed, methods used, representative post-treatment photos, and a map delineating the treated acres.

NRCS will:

- ☐ Prior to implementation, aid with interpretation of a current or updated FMP on acres targeted by this enhancement.
  - o Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - o Forest Stand Improvement (Code 666)
  - o Integrated Pest Management (Code 595)
  - o Forest Trails and Landings (Code 655)
  - o Access Road (Code 560)
- ☐ As needed, prior to implementation, NRCS will provide technical assistance in:
    - o Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and will discuss the details with the participant.
- ☐ Prior to implementation, discuss the requirement to follow the state's Forestry Best Management Practices (BMPs).
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666D

CONSERVATION STEWARDSHIP PROGRAM

Forest management to enhance understory vegetation

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants, Animals, Water

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages the structure and composition of overstory and understory vegetation to:

- Reduce vulnerability to damage by insects and diseases of forest trees. Canopy gaps and open understory allow for air circulation that reduces the incidence of disease, and the improved health of the residual trees increases their ability to withstand insect attacks
- Managing the understory vegetation will also reduce the risk of wildfire and promote development of herbaceous plants that benefit wildlife.
- Capture additional moisture and filters the water through the vegetation and soil.
- Managing the understory vegetation will increase available water to plants, minimize run-off and erosion, improve water quality, and limit nutrient entry into ground water.
- Reducing the number of trees per acre provides canopy openings that allow sunlight to reach the forest floor and promote the growth of herbaceous plants, improving wildlife shelter and cover in the forest understory.

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

Criteria:

CONSERVATION STEWARDSHIP PROGRAM

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.
- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), and Herbaceous Weed Control (Code315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard.

CONSERVATION STEWARDSHIP PROGRAM

Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

- The acres planned must have an "acceptable growing stock" level of at least the B line on an appropriate stocking chart.
- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
  a. Excessive volatile live vegetation and woody debris –When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
  b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
  c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required provided the fuel continuity is disrupted.
  d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- ☐ Prior to implementation, develop an understanding of management practices that reduce a dense understory of small trees and brush, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- ☐ Prior to implementation, work with a professional forester to prepare or update a current Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for thinning the stand and maintaining fully stocked conditions as specified in enhancement criteria. Depending on the resource concern addressing the FMP will also include recommended practices for managing understory vegetation to:
  - o Minimize risks of insect and disease outbreaks.
  - o Include recommended practices for managing understory vegetation to favor moisture infiltration.
  - o The FMP will also include recommended practices for managing understory vegetation to favor wildlife cover and shelter.
  - o Include recommended practices for managing understory vegetation to capture nutrients.
- ☐ Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - o Brush Management (Code 314)
  - o Forest Trails and Landings (Code 655)
  - o Herbaceous Weed Control (Code 315)
  - o Integrated Pest Management (Code 595)
  - o Woody Residue Treatment (Code 384)
  - o Prescribed Burning (Code 338)
- ☐ Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- ☐ Prior to implementation, work with a professional forester who will mark trees and groups of trees to be removed or killed, and who will develop a strategy for controlling undesirable understory vegetation.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- ☐ During implementation, follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and specifications provided by NRCS, to ensure that:
  - o Trees are removed, killed, or retained to achieve all planned purposes and landowner objectives.
  - o The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
  - o The operation avoids or minimizes damage to desirable vegetation.
- ☐ During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- ☐ During implementation, reduce stand stocking to correspond with the B-line of an appropriate stocking chart, retaining trees with larger, healthy crowns and undamaged trunks. If tree removal is not an option, reduce density by killing selected trees through girdling and/or chemically treatments.
- ☐ During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions. If prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a state approved prescribed burn plan. If using chemical methods, follow application and timing recommendations from an approved source.
- ☐ During implementation, limit the size of debris piles to minimize wildfire hazards.
- ☐ During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, take digital photos showing representative post-treatment conditions.
- ☐ After implementation, notify NRCS that the work has been completed and make treatment documentation records available for NRCS review and certification.

NRCS will:

- ☐ Prior to implementation, assist with interpretation of a current or updated FMP for sites where this enhancement will be applied.
- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- o Brush Management (Code 314)
- o Herbaceous Weed Control (Code 315)
- o Forest Stand Improvement (Code 666)
- o Woody Residue Treatment (Code 384)
- o Forest Trails and Landings (Code 655)
- o Integrated Pest Management (Code 595)
- o Prescribed Burning (Code 338)

- ☐ Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ After implementation, review treatment documentation records and certify that the enhancement was completed according to specifications in this enhancement, and in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666E

CONSERVATION STEWARDSHIP PROGRAM

Reduce height of the forest understory to limit wildfire risk

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.

CONSERVATION STEWARDSHIP PROGRAM

- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).
- The acres planned must have an “acceptable growing stock” level of at least the B line on an appropriate stocking chart.

CONSERVATION STEWARDSHIP PROGRAM

- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
  a. Excessive volatile live vegetation and woody debris – When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
  b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
  c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required as long as the continuity is disrupted.
  d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, work with a professional forester to develop or update a forestry management plan for the property.

☐ Prior to implementation, work with a professional forester to include **current** species, cover type, and size class distribution for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **desired** species, cover type, and size class distribution for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include in the updated or developed plan to identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, work with a professional forester using available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, work with professional forester and NRCS to delineate on a map the treatment areas and dates.

☐ Prior to implementation, discuss with professional forester or NRCS if NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) will be necessary for access or to reduce erosion from vehicles/equipment.

☐ Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris.

☐ Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Prescribed Burning (Code 338) to appropriately treat slash and debris.

☐ During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.

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☐ During implementation, keep evidence to support the treatment activities were completed using representative photos. Location of representative photos must be indicated on the map delineating treated areas.

☐ After implementation, notify NRCS that treatment has been completed and submit pictures and map to support this.

NRCS will:

☐ Prior to implementation, provide and discuss with participant, as needed, NRCS Conservation Practice Standards Forest Trails and Landings (Code 655), Woody Residue Treatment (Code 384), and Prescribed Burning (Code 338).

☐ Prior to Implementation, verify that participant plan has been developed or updated by a professional forester.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** species, cover type, and size class distribution for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and identifies and retains preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and uses available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

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☐ Prior to implementation, assist the landowner, as needed, to delineate on a map the treatment areas and dates of treatment.

☐ During Implementation, verify any planned changes in plan will meet the enhancement criteria.

☐ After Implementation, verify that the treatment has been completed and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666G

CONSERVATION STEWARDSHIP PROGRAM

Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 YEARS

Enhancement Description:

Opening the tree canopy along roads ("daylighting") and providing space between ground vegetation and tree crowns minimizes the spread of wildfires that often start along roads and improves wildlife habitat and food sources for many species. Some trees near a forest road are removed through harvesting, cutting, mulching, or another option available at the site, with the objective of creating a partially open forest canopy bordering the road. A semi-open canopy allows more sunlight to reach the forest floor to promote herbaceous understory plants and reduces maintenance needs by allowing moisture to evaporate from roads. The reduced canopy and herbaceous understory limit woodland fuel buildup and reduce fire intensity.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard (CPS) Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Apply the enhancement to sites where vegetation on roadsides presents a fire risk, is inadequate for wildlife habitat, or is detrimental to road maintenance. Treat a strip of forest on both sides of the road, as needed and if feasible. Implement the enhancement for a distance of at least 35 feet into the forest stand from the edge of the road, and extend the distance as needed up to 100 feet based on slope, aspect, soils, fuel type, etc. Use criteria in NRCS CPS Fuel Break (Code 383).

- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation

CONSERVATION ENHANCEMENT ACTIVITY

E666G

CONSERVATION STEWARDSHIP PROGRAM

Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.

CONSERVATION STEWARDSHIP PROGRAM

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.
- Wetland compliance and highly erodible land regulations must be followed.
- Trees removed as part of the treatment process that have marketable quality may be sold. Retain desirable species with large healthy crowns, and trees and shrubs that provide a diversity of wildlife food sources. Remove trees that are:
    - At high risk of mortality or failure (unless retained as a wildlife tree at a safe distance from the road)
    - Of low crown vigor
    - Of poor stem form and quality
    - Less-desirable species.
- Trees that cannot be sold may be removed by cutting, mulching, firewood distribution, or other means to reduce the canopy and allow sunlight to reach the forest floor. Trees further away from the road may be killed and left standing as snags, if they will not fall onto the road.
- Minimize damage to residual trees during the daylighting process.
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) Brush Management (Code 314), or Herbaceous Weed Control (Code 315) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384), to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

CONSERVATION STEWARDSHIP PROGRAM

- The understory vegetation can be maintained by prescribed burning where appropriate. Use NRCS CPS Prescribed Burning (Code 338). If prescribed burning is not an option, alternative methods may be used to manage the understory vegetation, such as mowing or fall disking.

- The daylighted area may be treated with herbicides to control noxious and invasive plants and undesirable woody vegetation to promote herbaceous plants. Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (Code 315)

- No daylighting activities should take place during the nesting season for ground nesting birds.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- Prior to implementation, develop an understanding of management practices that reduce tree density, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - Brush Management (Code 314)
  - Herbaceous Weed Control (Code 315)
  - Integrated Pest Management (Code 595)
  - Woody Residue Treatment (Code 384)
  - Prescribed Burning (Code 338)
- Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- Prior to implementation, work with a professional forester who will mark trees and groups of trees to remove and will develop a strategy for controlling undesirable understory vegetation.
- Prior to implementation, if prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a prescribed burn plan. If chemical methods will be used, obtain recommendations from an approved source.
- Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- During implementation, follow criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) and specifications provided by NRCS, to ensure that:
  - Overstory trees are removed or retained to achieve all planned purposes and landowner objectives.
  - The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
  - The operation avoids or minimizes damage to desirable vegetation.

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- During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- During implementation, treat a strip of forest on both sides of the road, if needed and feasible. Implement the enhancement for a distance of at least 35 feet into the forest stand from the edge of the road, and extend the distance as needed up to 100 feet from the road based on slope, aspect, soils, fuel type, etc.
- During implementation, focus on retaining healthy trees and when available retain trees that provide wildlife benefits such as oaks, hickories, etc.
- During implementation, remove trees that are at risk of mortality, trees with low crown vigor, trees with poor form and quality, and less-desirable species.
- During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions.
- During implementation, limit the size of debris piles to minimize wildfire hazards.
- During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- After implementation, take digital photos showing representative post-treatment conditions.
- After implementation, notify NRCS that the work has been completed and make treatment documentation available for NRCS review and certification.

NRCS will:

- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - Fuel Break (Code 383)
  - Brush Management (Code 314)
  - Herbaceous Weed Control (Code 315)
  - Forest Stand Improvement (Code 666)
  - Woody Residue Treatment (Code 384)
  - Forest Trails and Landings (Code 655)
  - Integrated Pest Management (Code 595)
  - Prescribed Burning (Code 338)
- As needed, prior to implementation, NRCS will provide technical assistance in:

CONSERVATION STEWARDSHIP PROGRAM

- Interpreting enhancement criteria relative to tree species to retain and remove or kill, and strategy for controlling undesirable understory vegetation.
- Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- Prior to implementation, ensure that the participant has an appropriate prescribed burn plan, herbicide recommendations from an approved source and an understanding of how these practices will be applied on the property.
- Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- During implementation, provide technical assistance if requested by the participant.
- After implementation, review documentation and photographs to verify the enhancement was completed according to specifications in this enhancement and NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666H

CONSERVATION STEWARDSHIP PROGRAM

Increase on-site carbon storage

CONSERVATION PRACTICE: 666 - Forest Stand Improvement

APPLICABLE LAND USE: Forest; Associated Ag Land; Farmstead

RESOURCE CONCERN: Soil, Air

ENHANCEMENT LIFE SPAN: 10 years

Enhancement Description

Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic matter.

Criteria

- Apply all of the following activities:
  - Retain all snags and downed woody debris of 6" diameter or larger at the base.
  - Identify leave-trees or clumps of trees that will be retained on site throughout their life span. These would ideally be trees that also provide wildlife habitat (e.g., future cavity/den trees, species that develop loose bark at older ages, mast producers, etc.).
  - Close unneeded roads and limit off-road vehicular traffic to avoid displacing the forest litter layer.

- Apply at least one activity from among the following as appropriate for the site:
  - Transition from even-aged to uneven-aged management.
  - Use regeneration methods (e.g., group selection, shelterwood, seed-tree, expanding gap) that call for retention of mature trees during the period when advanced regeneration develops.
  - Adopt techniques for maintaining and/or improving soil quality, specifically retention or organic carbon.
  - Maintain canopy cover to shade the forest floor and avoid hastening decomposition.

- During forest management activities, apply the following criteria:
    - Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
    - Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to maintain the stand, as much as possible, consistent with chosen regeneration method, in a fully stocked condition based on appropriate stocking guide.
    - Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
    - Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Refer to Conservation Practice Standard Forest Trails and Landings (Code 655) and Road/Trail/Landing Closure and Treatment (Code 654).
    - The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation:

- develop a new or updated forest management plan (FMP) that may reflect a change in management objectives.
- review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) that contains information needed to meet criteria for this enhancement.
- develop an understanding of the management that this is required to increase carbon storage appropriate for the resource setting to include the following activities:
    - implement forest management activities that begin a transition from even-aged to uneven-aged management.
    - retain dead wood and select trees or clumps of trees that are intended to be left on the site throughout their life span.
    - use regeneration methods (e.g., group selection, shelterwood, seed-tree, expanding gap) that require retention of mature trees during the period when advanced regeneration develops.
    - adopt techniques for maintaining and/or improving soil quality, specifically retention of organic carbon.

  - maintain canopy cover to shade the forest floor and avoid hastening decomposition.
- For forest lands, work with professional forester to prepare or update a current FMP that includes activities required to implement this enhancement. NRCS State Office will determine if a FMP will be required for Associated Ag Land or Farmstead settings. (Request NRCS technical assistance, as needed.)
- Arrange to have a professional forester or wildlife specialist, as part of developing or updating an FMP:
  - identify and map areas, selected trees, or groups of leave trees that can serve as wildlife habitat and that are intended to be left on site throughout their lifespan.
  - describe amounts and condition of standing snags and fallen woody debris with 6" or larger basal diameter.
  - identify and map trails or roads that can be planned for closure.
- Recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - Forest Trails and Landings (Code 655)
  - Road/Trial/Landing Closure and Treatment (Code 654)
  - Woody Residue Treatment (Code 384)
- Acquire all necessary approvals and permits (i.e., local, state, or federal, as applicable).

☐ During implementation:

- Follow FMP guidelines follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- Follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and in specifications provided by NRCS, to ensure that:
  - overstory tree and understory species are retained to achieve all planned purposes and landowner objectives.
  - establish required spacing, density, size-class distribution, number of trees, and amount of understory species to be retained.
  - schedule treatments to maintain the stand, as much as possible, consistent with the chosen forest regeneration method, in a fully stocked condition based on appropriate stocking guide.
  - avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- Evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria, as needed.

☐ After implementation:

- Ensure that retained leave areas are properly protected.
- Update the FMP to documentation treatment acres, completion dates and methods, and document representative treatments with digital photos.

- Notify NRCS that the work has been completed and make treatment documentation available for NRCS review and certification.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

☐ Prior to implementation:

- Provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
  - Forest Stand Improvement (Code 666)
  - Woody Residue Treatment (Code 384)
- Provide technical assistance in, as needed:
  - Guiding the proper sequence and timing of planned FMP treatment activities to meet requirements to maintain and increase on-site carbon storage.
  - Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- Ensure that the participant has a current and complete FMP describing all treatment activities for the resource setting.

☐ During implementation:

- Provide technical assistance if requested by the participant.
- Evaluate any planned changes to verify they meet the enhancement criteria.

☐ After Implementation:

- Verify the enhancement was implemented according to the NRCS Conservation Practice Standard Forest Stand Improvement Standard (Code 666) specifications and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666I

CONSERVATION STEWARDSHIP PROGRAM

Crop tree management for mast production

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land, Farmstead

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Forest stand improvement using crop tree management techniques to increase mast production.

Criteria

- States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.
- Identify the number of mast crop trees to be developed based on site productivity and spacing guidelines for the mast tree species. See State guidelines.
- Crop tree crowns should be in the upper level of the forest canopy (dominant and/or codominant trees), and not suppressed by other tree crowns.
- Cut or kill all trees whose crowns touch the crown of the crop tree on four sides (three sides if adjacent to another crop tree), and leave additional space for large crown development of mast crop trees. Crop trees will have >15 feet of space on all treated sides.
- Retain a diversity of tree species to reduce the potential impact of an epidemic event (e.g. insect outbreak) that may kill some/all trees.

- Trees that are below the crown of the crop tree or are not affecting crown development will be left to provide protection from wind damage, limit epicormic sprouting, and provide diversity for wildlife habitat.
- Trees removed that have marketable quality can be sold.
- All killed trees shall be left standing to provide wildlife habitat, except where snags will become a safety hazard (within 100 feet of a building, power line, road, etc.) or create a fire hazard. Snags that must be cut for safety reasons shall be left on site to become coarse woody debris on the forest floor (unless they create a fire hazard).
- As applicable, additional actions include:
    - Cutting damaging vines away from crop trees
    - Treatment of invasive plants that may be stressing crop trees
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or

when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, identify the number of dominant and/or codominant mast producing crop trees to be developed based on site productivity and spacing guidance for mast trees, as required in state specific guidelines. (NRCS will provide technical assistance, as needed.)
- ☐ During implementation, release all crop trees on all sides by killing competing trees within 15 feet of the crop tree's crown/canopy.
- ☐ During implementation, retain a diversity of tree species, cut damaging vines away from crop trees, and treat invasive plants that may stress crop trees.
- ☐ During implementation, leave all killed trees (unless removed as a merchantable product) standing to provide additional wildlife habitat, except where snags could become a safety hazard. Trees that must be cut for safety reasons will be left on site to become coarse woody debris on the forest floor.
- ☐ During implementation, protect the site from plant and animal pests, fire, and adverse impacts to the soil resource.

NRCS will:

- ☐ Prior to implementation, as needed, provide technical assistance in determining sites for enhancement implementation that meet specified criteria, including the number of crop trees per acre needed and the spacing of those trees.
- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement (as applicable for the site):
    - o Forest Stand Improvement (Code 666)
    - o Integrated Pest Management (Code 595)
    - o Forest Trails and Landings (Code 655)
    - o Access Road (Code 560)
    - o Woody Residue Treatment (Code 384)
    - o Prescribed Burning (Code 338)

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- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, document the number of crop trees per acre and average spacing and verify the post treatment stand conditions meet the specifications developed for the crop tree release activity.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666J

CONSERVATION STEWARDSHIP PROGRAM

Facilitating oak forest regeneration

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land

RESOURCE CONCERN: Plants, Animals

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (e.g., a regeneration cut). After a regeneration cut, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of oak seedlings and saplings. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Develop or update a forest management plan (FMP) in consultation with NRCS personnel and a professional forester to direct the management of the property. The FMP will include guidelines for the amount of advanced oak regeneration needed to achieve the desired future condition. It will describe the types of competition or other stressors that threaten oak survival and recruitment in the area, and recommend facilitating controls such as prescribed burning, chemical, and mechanical treatments to achieve desired outcomes. The FMP will also include guidelines for future inspection and monitoring, types of forest health impacts or stand damage to look for during inspections, and potential supplementary activities that may be needed to achieve additional oak recruitment and regeneration.

This enhancement may be applied only to forest stands that have already had a seed tree, shelterwood, thinning, or other silvicultural treatment designed to regenerate oak. The stands must contain an adequate amount of oak regeneration in the seedling and/or sapling stages, sufficient to achieve stand objectives if they survive and become fully established. The stands must also have evidence that the oak regeneration is not "free to grow" due to the presence of competing species. This enhancement is not appropriate for stands that have reached the pole timber size class because they are considered fully established at that point and stand management activities will be different.

- A forestry specialist will inspect the stand and identify existing or potential species of harmful insects, tree diseases, and invasive plants, as well as other biotic and abiotic (i.e. ice storms, drought, flooding, etc.) impacts on forest growth, health, structure and/or composition.

- A forestry specialist will conduct regeneration surveys according to methods described in the NRCS National Forestry Handbook, Title 190, Section 636.2.

- The forestry specialist will make recommendations for short-term treatments as needed. A skilled laborer will implement appropriate activities such as applying mechanical and spot chemical treatments, and/or installing tree protection.

- In appropriate settings, prescribed burning may be used to control vegetative competition after oak root systems are sufficiently established to re-sprout after a fire. With the recommendation of a forestry specialist, use NRCS Conservation Practice Standard Prescribed Burning (Code 338), or CSP Enhancement E338B, Short-interval burn.

- The forestry specialist will recommend additional practices as needed to correct undesirable forest health conditions. Practices may include: NRCS Conservation Practice Standards Integrated Pest Management (Code 595), Brush Management (Code 314), Herbaceous Weed Control (Code 315).

- Forest stands lacking sufficient oak regeneration with no surrounding seed-producing oaks may need an enrichment planting of oak. Use NRCS Conservation Practice

Standard Tree and Shrub Establishment (Code 612). Prescribed burning may not be appropriate where trees have been recently planted.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, the participant will obtain a new or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will identify regeneration needs, competition that impedes oak regeneration and recruitment, other forest health concerns, and activities recommended for implementation. The participant will make the FMP available for NRCS review.
- Prior to implementation, arrange for a forestry specialist to inspect the stand and perform the tasks identified in this enhancement.
- Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard and other applicable implementation documentation and use the information to meet the criteria of this enhancement.
- During implementation, the participant and the forestry specialist will ensure that regenerating oak trees are protected from any damage.
- During implementation, notify NRCS if there are any planned changes, to verify they meet the enhancement criteria.
- After implementation, notify NRCS that the work has been completed, and make the following information available to NRCS: dates that inspection was conducted, methods used, and the treatments applied to remove competition and protect young oaks.

NRCS will:

- Prior to implementation, verify the enhancement activity is planned for acres that meet the criteria within the enhancement guide sheet. Verify that a forest stand improvement treatment to initiate oak regeneration was previously applied, that regenerating seedling and/or sapling oaks are present, and that oak survival is threatened by competing species and/or other environmental stressors.
- Prior to implementation, provide assistance with interpretation of a new or updated FMP on acres targeted by this enhancement.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
    - Forest Stand Improvement (Code 666)

CONSERVATION STEWARDSHIP PROGRAM

- Integrated Pest Management (Code 595)
- Prescribed Burning (Code 338)
- Brush Management (Code 314)
- Herbaceous Weed Control (Code 315)
- Tree/Shrub Establishment (Code 612)
- Tree/Shrub Site Preparation (Code 490)

☐ As needed, prior to implementation, NRCS will provide technical assistance by:

- Preparing specifications for applying this enhancement for each site using approved guide sheets, implementation requirements, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and discussing the details with the participant.
- Providing methods for conducting regeneration surveys.

☐ During implementation, provide technical assistance if requested by the participant.

☐ During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.

☐ After implementation, certify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666L

CONSERVATION STEWARDSHIP PROGRAM

Forest Stand Improvement to rehabilitate degraded hardwood stands

Conservation Practice 666: FOREST STAND IMPROVEMENT

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.). Some crop tree species will meet multiple objectives (oak, cherry, black walnut, tulip-poplar, pine, spruce).
- Crop trees will receive a crown-touching release: any undesirable trees touching a crop tree crown will be cut or killed.

- Areas of 0.25 acre or more with no crop trees will be clear-cut, up to 3 acres in size.
- Forest stand improvement activities will be planned and applied in a manner to meet the habitat requirements for wildlife species of concern as determined by the state's NRCS Wildlife Habitation Evaluation Guide (WHEG) and will be managed to achieve or maintain a value of 0.75 or greater.
- Invasive species will be controlled before tree cutting begins.
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Treatment activities will be conducted during periods of the year that accommodate reproduction and other life-cycle requirements of the targeted wildlife and pollinator species.
- Retain a diversity of tree species, where possible, to reduce the potential impact of an epidemic event (e.g. insect outbreak) that may kill trees of some species.
- Trees removed that have marketable quality can be sold.
- Killed trees that do not interfere with tree regeneration shall be left standing to provide wildlife habitat, except where snags will become a safety hazard (within 100 ft. of a building, power line, road, etc.) or create a fire hazard. Snags that must be cut for safety reasons shall be left on site to become coarse woody debris on the forest floor (unless they create a fire hazard).
- As applicable, cut damaging vines away from crop trees
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.

CONSERVATION STEWARDSHIP PROGRAM

- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (code 338).
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- ☐ Prior to implementation, work with professional forester to develop forest management plan documenting which of the three methods will be used (crop tree release, group selection, or clear cut) and in what stands they will be implemented.
- ☐ Prior to implementation, work with professional forester and/or NRCS to determine ways to implement the enhancement that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- ☐ Prior to implementation, work with professional forester and/or NRCS to protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation.
- ☐ Prior to implementation, work with professional forester and/or NRCS if temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- ☐ Prior to implementation, work with professional forester and/or NRCS to delineate areas to be treated on a map (s).
- ☐ Prior to implementation, work with professional forester and/or NRCS to complete an Implementation Requirements sheet for NRCS Conservation Practice Standard Forest Stand Improvement (Code 666). Depending on method(s) specified in the plan, address:
    - o Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.).
    - o Identify areas of 0.25 to 1 acre in size that will have group selection.
    - o Identify areas of 1-3 acres in size that will be clear cut.
    - o Specify how undesirable trees and shrubs will be cut or killed.

Stand #	Treatment Option

- ☐ Invasive species will be treated prior to implementation or concurrently with cut.

- ☐ During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.
- ☐ During implementation, verify that killed trees/snags that do not interfere with regeneration are left standing or cut and left on site (if safety hazard).
- ☐ During implementation, cut damaging vines away from crop trees.
- ☐ After implementation, notify NRCS that implementation has been completed.

NRCS will:

- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - o Integrated Pest Management (Code 595)
  - o Woody Residue Treatment (Code 384)
  - o Prescribed Burning (Code 338)
  - o Access Road (Code 560)

- ☐ Prior to Implementation, provide and explain, as needed, NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) and assist the participant in completing an Implementation Requirements sheet. Depending on method(s) specified in the plan address:
  - o Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.).
  - o Identify areas of 0.25 to 1 acre in size that will have group selection.
  - o Identify areas of 1-3 acres in size that will be clear cut.
- ☐ Prior to implementation, assist landowner to determine ways to implement the enhancement that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- ☐ Prior to implementation, assist landowner to protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. Provide and document with Participant on NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) Implementation requirements sheet.
- ☐ Prior to implementation, if temporary access is needed, provide participant with NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, as needed, provide assistance in delineating treatment area on a map(s).
- ☐ Prior to implementation, verify that invasive species have been treated or treating concurrently with cut.
- ☐ Prior to implementation, Wildlife Habitat Evaluation Guide (WHEG) or State equivalent must be completed. **Existing condition WHEG score:_____ Planned after implementation WHEG score:_____**
- ☐ During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify that killed trees/snags that do not interfere with regeneration are left standing or cut and left on site (if safety hazard).
- ☐ After implementation verify that damaging trees have been removed from crop trees.
- ☐ After implementation, Wildlife Habitat Evaluation Guide (WHEG) or State equivalent must be completed and have a value of 0.75 or greater. **After implementation WHEG score:_____**
- ☐ After Implementation, verify the enhancement was implemented according to the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) specifications and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666S

CONSERVATION STEWARDSHIP PROGRAM

Facilitating longleaf pine regeneration and establishment

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land

RESOURCE CONCERN: Plants, Animals

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Facilitate longleaf pine regeneration and establishment following a forest stand improvement treatment for natural regeneration (e.g., a regeneration cut), or where longleaf has been previously planted. After a regeneration cut or a planting, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of longleaf pine. This enhancement will release seedling and sapling longleaf from competing invasive plants and other undesirable species. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in longleaf pine regeneration and establishment by providing for follow-up activities that require the expertise of a professional forester.

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Develop or update a forest management plan (FMP) in consultation with NRCS personnel and a professional forester to direct the management of the property. The FMP will include guidelines for the amount of advanced longleaf pine regeneration needed to achieve the desired future condition. It will describe the types of competition or other stressors that threaten longleaf survival and recruitment in the area, and recommend facilitating controls such as prescribed burning, chemical, and mechanical treatments to achieve desired outcomes. The FMP will also include guidelines for future inspection and monitoring, types of forest health impacts or stand damage to look for during inspections, and potential supplementary activities that may be needed to achieve longleaf establishment and recruitment.

- stands that have already had a seed tree, shelterwood, thinning, or other silvicultural treatment designed to regenerate longleaf pine. The stands must contain an adequate amount of longleaf regeneration or planted trees in the seedling and/or sapling stages, sufficient to achieve stand objectives if they survive and become fully established. The stands must also have evidence that the longleaf regeneration is not "free to grow" due to the presence of competing species. This enhancement is not appropriate for stands that have reached the pole timber size class because they are considered fully established at that point and stand management activities will be different.

- A forestry specialist will inspect the stand and identify existing or potential species of harmful insects, tree diseases, and invasive plants, as well as other biotic and abiotic (i.e. ice storms, drought, flooding, etc.) impacts on forest growth, health, structure and/or composition.

- A forestry specialist will conduct regeneration surveys according to methods described in the NRCS National Forestry Handbook, Title 190, Section 636.2.

- The forestry specialist will make recommendations for short-term treatments as needed. A skilled laborer will implement appropriate activities such as applying mechanical and spot chemical treatments.

- In appropriate settings, prescribed burning may be used to control vegetative competition after longleaf root systems are sufficiently established to re-sprout after a fire. With the recommendation of a forestry specialist, use NRCS Conservation Practice Standard Prescribed Burning (Code 338), or CSP Enhancement E338B, Short-interval burn.

- The forestry specialist will recommend additional practices as needed to correct undesirable forest health conditions. Practices may include: NRCS Conservation Practice Standards Integrated Pest Management (Code 595), Brush Management (Code 314), Herbaceous Weed Control (Code 315), etc..

- Forest stands lacking sufficient longleaf regeneration may need an enrichment planting of longleaf. Use NRCS Conservation Practice Standard Tree and Shrub Establishment (Code 612). Prescribed burning may not be appropriate where trees

- have been recently planted.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, the participant will obtain a new or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will identify regeneration needs, competition that impedes longleaf regeneration and recruitment, other forest health concerns, and activities recommended for implementation. The participant will make the FMP available for NRCS review.
- Prior to implementation, arrange for a forestry specialist to inspect the stand and perform the tasks identified in this enhancement.
- Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard and other applicable implementation documentation and use the information to meet the criteria of this enhancement.
- During implementation, the participant and the forestry specialist will ensure that regenerating longleaf trees are protected from any damage.
- During implementation, notify NRCS if there are any planned changes, to verify they meet the enhancement criteria.
- After implementation, notify NRCS that the work has been completed and make the following information available to NRCS: dates that inspection was conducted, methods used, and the treatments applied to remove competition and protect young longleafs.

NRCS will:

- Prior to implementation, verify the enhancement activity is planned for acres that meet the criteria within the enhancement guide sheet. Verify that a forest stand improvement treatment to initiate longleaf regeneration, or longleaf planting, was previously applied, that regenerating seedling and/or sapling longleaf pines are present, and that longleaf survival is threatened by competing species and/or other environmental stressors.
- Prior to implementation, provide assistance with interpretation of a new or updated FMP on acres targeted by this enhancement.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
    - Forest Stand Improvement (Code 666)

- Integrated Pest Management (Code 595)
- Prescribed Burning (Code 338)
- Brush Management (Code 314)
- Herbaceous Weed Control (Code 315)
- Tree /Shrub Establishment (Code 612)
- Tree/Shrub Site Preparation (Code 490)

- As needed, prior to implementation, NRCS will provide technical assistance by:
  - Preparing specifications for applying this enhancement for each site using approved guide sheets, implementation requirements, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and discussing the details with the participant.
  - Providing methods for conducting regeneration surveys.
- During implementation, provide technical assistance if requested by the participant.
- During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.
- After implementation, certify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328C

CONSERVATION STEWARDSHIP PROGRAM

Conservation crop rotation on recently converted CRP grass/legume cover

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Rotation minimizes disturbance (STIR less than 10) and reduces soil erosion below soil tolerance level. Enhancement not applicable on hayland.

Criteria

- Enhancement limited to acres where the conversion from Conservation Reserve Program (CRP) grass/legume conservation cover to annual cropland took place not more than 2 years prior to enrollment in Conservation Stewardship Program.
- This enhancement is not applicable on hayland.
- Crops shall be grown in a planned sequence as outlined in the implementation requirements.
- The crop rotation must include a minimum of three different crop types. For the purpose of this enhancement a cover crop is considered a different crop.
- Select crops, a tillage system, and cropping sequence(s) that will produce sufficient and timely quantities of biomass or crop residue which, in conjunction with other

practices in the management system that will reduce soil erosion from water and wind to a level below the soil tolerance (T) level (average annual soil loss).

CONSERVATION STEWARDSHIP PROGRAM

- Crop management must minimize soil disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 for the crop rotation (management STIR value).
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is planned for acres where the conversion from CRP grass/legume conservation cover to annual cropland took place no more than 2 years prior to enrollment in CSP. **Date of Conversion:** _____

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, verify the enhancement is not planned on hayland.
- ☐ Prior to implementation, use information provided from the participant to calculate soil loss estimates and STIR calculations using the current NRCS approved wind and water erosion prediction technologies. The planned rotation must meet the enhancement criteria of a management STIR value of less than 10 and average annual soil erosion from water and wind less than "T".

  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR value = _____

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to calculate soil loss estimates and STIR calculations. The applied rotation must meet the enhancement criteria above. **Soil erosion = _____t/ac/year and STIR value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328D

CONSERVATION STEWARDSHIP PROGRAM

Leave standing grain crops unharvested to benefit wildlife

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: ANIMALS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

Criteria

- Crops must be grown in a planned sequence as outlined in the plan. The crop rotation shall include a minimum of three different crops. For this purpose, a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.
- Select the crops and crop management activities that provide food, cover, and shelter for the targeted wildlife species using an approved habitat evaluation procedure.
- Leave a minimum ½ acre of unharvested, standing grain crops for each 40 acres of cropland. Unharvested plots shall be located in a single location on the 40 acre unit and additional plots shall be located on different 40 acres. *This enhancement is to be planned, contracted, and implemented on an entire field, not just the unharvested acres.*

CONSERVATION STEWARDSHIP PROGRAM

- Locate the unharvested plots adjacent to permanent cover such as brushy fence rows, field borders, forest land, or wetlands (this does not include newly established vegetation).
- Leave unharvested crops standing over winter until it is time to prepare the soil for planting the next crop.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, provide NRCS with the planned crop rotation.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

- ☐ Prior to implementation, develop a map showing planned location(s), crop type(s), and acreage of crops to be left unharvested.
- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or unharvested areas to verify the planned system meets the enhancement criteria.
- ☐ During implementation, take photos of all unharvested plots. Photos must indicate field location and date.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.
- ☐ After implementation, make a map showing implemented location(s), crop type(s), and acreage of crops that were left unharvested each year available for review by NRCS to verify implementation of the enhancement.
- ☐ After implementation, make photos of the unharvested plots available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.
- ☐ As needed, provide technical assistance in selecting crops for food, cover, and shelter according to the approved habitat evaluation procedure.
- ☐ As needed, provide additional assistance to the participant as requested.

- ☐ During implementation, evaluate planned crop changes, crop rotation, or unharvested areas to verify the planned system meets the enhancement criteria.
- ☐ After implementation, review the map(s) showing implemented location(s), crop type(s), and acreage of crops that were left unharvested each year, to verify implementation of the enhancement.
- ☐ After implementation, review photos of unharvested plots to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328F

CONSERVATION STEWARDSHIP PROGRAM

Modifications to improve soil health and increase soil organic matter

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Crops must be grown in a planned sequence as outlined in plan. The crop rotation must include a minimum of four different crops. For purposes of these criteria a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

CONSERVATION STEWARDSHIP PROGRAM

- Evaluation of the modified cropping system must produce a soil conditioning index (SCI) of zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. (management SCI value)

- Soil health assessment will be used to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion, as well as additional soil health objectives of the individual grower (primary assessment made in Year 1). During Year 3, a follow up assessment will be completed to allow time for changes to crop rotation and management activities to have an impact on soil health. No specific soil health assessment type is required or recommended by NRCS, but at a minimum the assessment must account for soil organic matter. The specific assessment selected should provide the grower information based on their soil health objectives.

- Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current/planned crop rotation and field operation(s) used for each crop.

Current/Planned Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Current/Planned Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

- ☐ Prior to implementation, select an assessment based on your soil health objectives.

Soil Health Assessment

Producer Objective	**Year 1 Assessment (Value)**	**Year 3 Assessment (Value)**
Soil Organic Matter (Required)		

CONSERVATION STEWARDSHIP PROGRAM

☐ During implementation, adjust crops, crop rotation, or field operations to improve the system after receiving the results of the soil health assessment. Complete in Year 1 and Year 3 at a minimum. Document adjustments below:

Adjusted Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Adjusted Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ Prior to implementation, verify the planned crop rotation includes at least four different crops.

☐ Prior to implementation, use information provided from the participant to calculate the management Soil Conditioning Index (SCI) value for each field using current NRCS wind and water erosion prediction technologies. Crop rotation must produce a positive trend in the Organic Matter (OM) subfactor value. **Management SCI Value = _____**
OM subfactor value = _____

- ☐ During implementation, evaluate planned adjustments in crops, crop rotation, or field operations to verify the new system meets the enhancement criteria.

- ☐ After implementation, evaluate the applied crop rotation or management using information provided from the participant to calculate SCI values to document that the applied rotation met the enhancement criteria.
  Management SCI Value = _____ OM subfactor value = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328G

CONSERVATION STEWARDSHIP PROGRAM

Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Conservation Practice 328: Conservation crop rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCMENT LIFE SPAN: 1 Year

Enhancement Description

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

Criteria

- This enhancement is limited to acres where the conversion of CRP grass/legume conservation cover to annual crops took place not more than 2 years prior to enrollment in CSP. This enhancement is not applicable on hayland.
- Crops must be grown in a planned sequence as outlined in plan. The crop rotation must include a minimum of four different crops. For purposes of these criteria a cover crop is considered a different crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.

CONSERVATION STEWARDSHIP PROGRAM

- Grow crops that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index. (management SCI value)
- The crop rotation includes at least 2 years of high residue crops and/or cover crops per 3 years of the rotation. **(See STATE list of high residue crops)**
- For crop diversity, the planned crop sequence of at least 4 different crops should contain at least 3 different crop types; for example a mix of the following: warm season grass; warm season broadleaf; cool season grass; cool season broadleaf.
- Leave crop residue on the soil surface throughout the year.
- Keep a living root system established as much as practical for the given soil, cropping system, and climate area. Maximize root growth periods by planting the next crop or cover crop as soon as practical after the harvest and/or utilize perennial crops in the rotation. Aim to have living roots at least 90% of available growing days. **(See STATE provided guidance of options to maximize living root systems in local climate and cropping systems; determine available growing days and period of no growth, such as frozen periods in the north)**. Show before and after management files from current NRCS wind and water erosion prediction technologies to document benchmark and planned crop rotation to show increase in living root periods.
- Minimize all types of soil disturbance. No more than one crop-year in the rotation will have a Soil Tillage Intensity Rating (STIR) value greater than 20 and the rotation will have a positive trending SCI.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and planned field operation(s) used for each crop.

Current Management – Crop Rotation

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)	Crop Type (Warm Grass-WG, Cool Grass-CG, Warm Broadleaf-WB, Cool Broadleaf-CB)

Current Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management – Crop Rotation *(Crop rotation must include at least 4 different crops from 3 of the different crop types. The rotation must also include 2 years of high residue crops and/or cover crops per 3 years of the rotation. Use STATE list of high residue crops.)*

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)	Crop Type (Warm Grass-WG, Cool Grass-CG, Warm Broadleaf-WB, Cool Broadleaf-CB)

Planned Management – Field Operations

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, leave crop residue on the soil surface throughout the year.

☐ During implementation, take dated pictures with field indicated at least every 3 months to show residue or growing crops.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

☐ After implementation, provide for review pictures showing residue or growing crops throughout the year.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ Prior to implementation, verify the enhancement is planned for acres where the conversion from CRP grass/legume conservation cover to annual cropland took place no more than 2 years prior to enrollment in CSP. **Conversion Date:**_____

☐ Prior to implementation, verify the enhancement is not planned on hayland.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, verify the crop rotation includes at least 2 years of high residue crops and/or cover crops per 3 years of the rotation. (Use STATE list of high residue crops)

- ☐ Prior to implementation, verify the planned crop rotation includes at least 4 different crops and contains at least 3 different crop types; for example a mix of the following: warm season grass; warm season broadleaf; cool season grass; cool season broadleaf.
  Planned number of crops: _____
  Planned number of crop types:_____

- ☐ Prior to implementation, use information provided from the participant to calculate the management Soil Conditioning Index (SCI) value for each field using current NRCS wind and water erosion prediction technologies. Crop rotation must produce a positive trend in the Organic Matter (OM) subfactor value.
  Management SCI Value = _____ **OM subfactor value = _____**

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to document that the applied rotation met the enhancement criteria.
  Applied number of crops: _____
  Applied number of crop types:_____

- ☐ After implementation, if the applied crop rotation is different than the planned crop rotation, use information provided from the participant to calculate SCI value to document that the applied rotation met the enhancement criteria.
  Management SCI Value = _____ OM subfactor value = _____

- ☐ After implementation, review pictures showing residue or growing green crops throughout the year to verify the applied system meets the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328I

CONSERVATION STEWARDSHIP PROGRAM

Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

Criteria

- This enhancement is applicable on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **(Refer to state specific guidance of options to maximize nutrient uptake in local climate and cropping systems)**

- Forage species, seedbed preparation, seeding rates, seeding dates, seeding depths, fertility requirements, and planting methods will be consistent with applicable local criteria and soil/site conditions. **(Refer to state specific lists of forage crops known to effectively utilize and scavenge nutrients)**

- Select forage crop (single species or mix of two or more species) and planting dates which will not compete with the other crop(s) yield or harvest. ***If legumes are part of the forage mix, consider that this may add nutrients to the system.***

- Select forage crop that is compatible with other components of the crop rotation and for its ability to efficiently scavenge and utilize excess soil nutrients, specifically nitrogen or phosphorous, whichever is identified as a potential risk to water quality. Nutrient uptake only occurs when a crop is actively growing. Therefore, it is imperative that the crops in rotation be planted as soon as possible after forage crop harvest (hay/balage/haylage/etc.) to maximize nutrient cycling and minimize offsite transport of nutrients.

- Determine method and timing of forage crop harvest to meet client objectives. Harvest the forage crop as late as practical to maximize plant biomass production and nutrient uptake.

- Ensure any herbicides used in the crop rotation are compatible with forage crop selections.

- Do not burn forage or residue.

- Do not graze forage crop.

- Reduce or maintain soil erosion from water and wind to below soil tolerance (T) level (average annual soil loss).

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation and field operation(s) used for each crop.

Document excess nutrients identified in soil tests. *Soil tests should be taken as close to production crop harvest as possible.*

Field	Soil Test Date	Nutrient (Nitrogen or Phosphorus)	Soil Test Nutrient Result (ppm or lbs/ac)

Current Management Rotation

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Current Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Management Rotation including Forage Crop

Field	Planned Crops/Forage Crop (in sequence)	Planting Date	Harvest Date

Planned Field Operations for Each Crop

Field	Crop	Field Operation	Timing of Field Operation (month/year)

Planned Forage Crop and Seeding Rate *(forage crop may be single species or mix of two or more species)*

Species	Variety	Seed Size	Typical Seeding Depth	Seeding Rate (PLS lbs/acre)	Percent of Mix (%)

Forage Crop Establishment and Management Considerations:

- ☐ Establish forage crop mix as soon as practical prior to or after harvest of the production crop.
- ☐ During implementation, forage crop must not be grazed or burned.
- ☐ During implementation, notify NRCS of any planned changes in forage crop mix or crop rotation, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, update the tables above to document the applied crop rotation for the contract period and provide to NRCS.

After implementation, complete the table below and provide to NRCS

Task	Provide information and details
Seedbed Preparation	
Seeding Date	
Seeding Depth	
Seeding Method	
Fertilizer, as needed	
Weed Management, as needed	
Harvest Date (window)	
Harvest Method	

NRCS will:

☐ As needed, provide technical assistance in selecting forage crop for the crop rotation or substitute species that would meet the criteria of the enhancement. Forage crop may consist of a single species or mix of two or more species.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the enhancement is being planned on fields where excess soil nutrients cause or increase water quality degradation concerns. Presence of excess nutrients must be identified in recent soil tests or increased risk to water quality documented by risk assessment tool. **<REFER TO STATE SPECIFIC GUIDANCE>**

☐ Prior to implementation, use information provided from the participant to calculate the average annual soil erosion value (water and wind) for each field using NRCS erosion prediction technologies.

Benchmark Management Soil Loss = _____ tons/acre/year

Planned Management Soil Loss = _____ tons/acre/year

☐ During implementation, evaluate any planned changes in forage crop selected, timing in crop rotation, management, or field operations to verify the new system meets the enhancement criteria.

☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to calculate average annual erosion value to document that the applied rotation meets the enhancement criteria.

Applied Management Soil Loss = _____ tons/acre/year

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E328L

CONSERVATION STEWARDSHIP PROGRAM

Leaving tall crop residue for wildlife

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (annual and mixed)

RESOURCE CONCERN ADDRESSED: Animals

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

Criteria

- The entire crop field must be harvested with residual stubble height minimum of 14 inches on average throughout the field. Only acres with this minimum stubble height are eligible for payment.
- Stubble must remain undisturbed until the State designated date in the following year to provide cover throughout winter months
- Planting and management of cover crops is not prohibited if it does not compromise the height and structure of the stubble cover
- States will supply a list of eligible crops and specify the dates that stubble must remain undisturbed for this enhancement.
- When possible, reduce or eliminate the use of herbicide treatments on weedy growth between the rows to provide additional cover and food sources for wildlife.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, develop a map showing planned location(s), crop type(s) and acreage of crops to leave tall standing stubble.

☐ After implementation, provide photo documentation of stubble height left standing.

NRCS will:

☐ As needed, provide technical assistance in selecting crop rotations or substitute crops that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant.

☐ After implementation, verify stubble height and ensure stubble is left standing after winter months.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E328M

Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Conservation Practice 328: Conservation Cropping System

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Diversify existing crop rotation by adding pollinator friendly canola or sunflower crops into the rotation. The crop rotation shall include a minimum of three different crops. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides compliant with grower industry best management practice is allowed only during pre-bloom and bloom of canola or sunflower.

Criteria

- Crops will be grown in a planned sequence and shall include a minimum of three different crops.
- The crop rotation must include at least one year of canola or sunflower. Other pollinator friendly crops may be included. For these criteria, a pollinator friendly cover crop is considered a different crop. A pollinator friendly crop is defined as a crop, planted for harvest or as a cover crop, which provides nectar for pollinators and other beneficial insects. Examples of pollinator friendly crops are canola, sunflowers, clovers, and borage. To meet the purpose and definition of a pollinator friendly crop, these "flowering" crops must be allowed to bloom prior to harvest or termination. **<REFER TO STATE SPECIFIC LIST OF POLLINATOR FRIENDLY CROPS>**

CONSERVATION STEWARDSHIP PROGRAM

- Each year the enhancement is planned, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Plan/contract the actual acres planted to the pollinator friendly crop.
- Where applicable, plan suitable crop substitutions when the planned crop cannot be planted due to weather, soil conditions, or other local situations.
- Foliar systemic insecticides may not be applied to the pollinator friendly crop.
- Insecticides and fungicides applied during crop pre-bloom and bloom period of the canola or sunflower crop must be mitigated through integrated pest management and must follow industry best management practices.
    - Apply pesticides only when economic thresholds are met.
    - Apply pesticides at night or within two hours of sunset as this is when bees are least active.
    - Follow best practices for minimizing drift:
        - Use a low-drift nozzle, calibrate spray equipment, and use medium-to-coarse droplet size if possible.
        - Install cones or shrouds on field sprayers to reduce off- field movement.
        - When spraying fields, consider spot spraying or only applying pesticides to infested areas.
    - Select crop pest products with a residual activity of less than 8 hours.
    - Improve foraging areas for bees and other pollinators. Where possible, include flowering plants in non-crop areas. Avoid pesticide drift onto non-crop areas that include floral resources. Leave areas that include these resources intact whenever possible.

References

National Sunflower Association of Canada. Sunflower Production Guide. http://www.canadasunflower.com/production/sunflower-production-guide/

U. S. Canola Association. 2019. Best management Practices (BMPS) for Pollinator Protection in Canola Fields. https://www.uscanola.com/wp-content/uploads/2019/07/HBHC_Canola_030119.pdf

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current and planned crop rotation for all cropland acres on the operation. **<REFER TO STATE SPECIFIC LIST OF POLLINATOR FRIENDLY CROPS>**
- ☐ Prior to implementation, as needed, NRCS can provide technical assistance in selecting pollinator crops for the crop rotation or substitute species that would meet the criteria of the enhancement.
- ☐ Prior to implementation, provide maps for review by NRCS of the planned crop rotation, including areas which will include the pollinator friendly crops. Each year the enhancement is planned, at least 5% of the cropland acres on the operation must be planted to a pollinator friendly crop.

Current Management Rotation (complete table for each rotation)

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Planned Management Rotation including Pollinator Friendly Crops (complete table for each rotation)

Field	Planned Crops (in sequence)	Planting Date	Harvest Date	Acres in rotation

☐ During implementation, maintain records of any pesticide applications to canola, sunflower or pollinator friendly crops, including timing, material/product, application rate, and crop stage.

Field	Crop	Insecticide Applied	Application Date	Application Rate	Crop Stage

☐ During implementation, notify NRCS of any planned changes in crop rotation, pesticide applications, or management to verify the planned system meets the enhancement criteria.

☐ After implementation, if changes were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS for review.

☐ After implementation, provide insecticide application records to NRCS for review to verify implementation meets the enhancement criteria.

NRCS will:

☐ As needed, provide technical assistance in selecting pollinator crops for the crop rotation or substitute species that would meet the criteria of the enhancement.

☐ As needed, provide additional assistance to the participant as requested.

☐ Prior to implementation, verify the crop rotation meets the criteria of the enhancement. *Plan/ contract the actual acres planted to canola or sunflower.*

☐ During implementation, evaluate any planned changes in crop rotation, pesticide applications, or management to verify the new system meets the enhancement criteria.

- ☐ After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to verify the applied rotation meets the enhancement criteria.
- ☐ After implementation, review pesticide application records to verify implementation meets the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number_____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E328N

Intercropping to improve soil health

Conservation Practice 328: Conservation Crop Rotation

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN ADDRESSED: Soil Quality Limitations

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

This enhancement involves the use of intercropping principles (i.e., growing two or more crops in close proximity to each other during part or all of their life cycles) to promote interactions that improve soil health, plant health, reduce inputs via increased biodiversity and contribute to pest management. Incorporating intercropping principles into an agricultural operation increases diversity and interaction between plants, arthropods, mammals, birds and microorganisms resulting in a more stable crop-ecosystem and a more efficient use of space, water, sunlight and nutrients. Furthermore, soil health is benefited by increasing ground coverage with living vegetation which reduces erosion and by increasing the quantity and diversity of root exudates which enhances soil fauna. This collaborative type of crop management mimics nature and is subject to fewer pest outbreaks, improved nutrient cycling and crop nutrient uptake, and increased water infiltration and moisture retention. **This enhancement cannot be used for annual hay or silage crops. It is for grain/seed/vegetable production only.**

Criteria

One or more of the following intercropping systems shall be used. Systems can be mixed during the contract period allowing for within year diversity on the same field. Producers should consult with the UDSA-Risk Management Agency (RMA) to clarify and understand how the use of any of the criteria options below might impact insurability of any cash crop grown using these methods.

- Plant two or more crops simultaneously in the same field. For example, planting chickpeas and flax together either in alternate rows or mixed within rows. Another example could be planting vegetables that perform well together, e.g. the "three sisters" intercropping system of corn, beans and squash.

- Relay intercropping – grow two or more crops on the same field with the planting of the second crop before the first crop is harvested. This cropping strategy enables production of a second crop in areas where time for seeding the second crop is considered inadequate for double cropping. For example, seeding soybeans into wheat that is still growing.

- Strip intercropping – grow crops in alternate strips wide enough to permit separate crop production machinery, but close enough for crops to interact (e.g., planting alternating strips of corn and soybeans 6 rows each or alternating strips of corn and Sudan grass). Generally, the maximum width of individual strips for effective interaction of crop pests and their natural enemies is about 30 ft. Note: this criterion is not the same as NRCS Conservation Practice Stripcropping Code 585

Documentation and Implementation Requirements

Participant will:

- Prior to implementation, provide NRCS with the current and planned crop rotation, including intercropping system used, for all cropland acres on the operation.
- Prior to implementation, provide maps for review by NRCS of the planned crop rotation.
- During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- During implementation, take dated pictures with field indicated at least every 3 months to show growing intercrops.
- After implementation, provide for review pictures showing growing intercrops throughout the year.

Current Management Rotation (complete table for each rotation)

Field	Current Crops (in sequence)	Planting Date	Harvest Date

Planned Management Rotation With Intercropping (complete table for each rotation)

Field	Planned Crops (in sequence)	Planting Date	Harvest Date

NRCS will:

- As needed, provide technical assistance in selecting intercropping systems for the crop rotation that would meet the criteria of the enhancement.
- As needed, provide additional assistance to the participant as requested.
- Prior to implementation, verify the crop rotation meets the criteria of the enhancement. ***Plan/contract the actual acres planted to the intercrops.***
- During implementation, evaluate any planned changes in crops, crop rotation, or management to verify the new system meets the enhancement criteria.
- After implementation, if there were any changes to planned rotation or management evaluate the applied crop rotation using information provided from the participant to verify the applied rotation meets the enhancement criteria.
- After implementation, review photos of the intercropping system.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329A

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce soil erosion

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish no till system to reduce sheet and rill and wind erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation (average annual soil loss).
- No full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The Soil Tillage Intensity Rating value must include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow

periods). Each crop must have a Soil Tillage Intensity Rating value of no greater than 10.

CONSERVATION STEWARDSHIP PROGRAM

- Use the current approved water and wind erosion prediction technology to determine the:
    - amount of randomly distributed surface residue needed;
    - time of year the residue needs to be present in the field, and
    - amount of surface soil disturbance allowed to reduce erosion to the desired level.
- Calculations must account for the effects of other practices in the management system.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, use information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a soil loss at or

CONSERVATION STEWARDSHIP PROGRAM

below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 10 for each crop in the planned rotation.

"T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____

☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329B

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce tillage induced particulate matter

Conservation Practice 329: Residue and Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Air

PRACTICE LIFE SPAN: 1 Year

Enhancement Description

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Field(s) must have an average annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination

of the current cash crop (includes fallow periods). Each crop must have a STIR value of no greater than 10.

- Use the current approved water and/or wind erosion prediction technology to determine the:
    - amount of randomly distributed surface residue needed;
    - time of year the residue needs to be present in the field, and
    - amount of surface soil disturbance allowed to reduce erosion to the desired level.
- Calculations shall account for the effects of other practices in the management system.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue shall be burned.

☐ During implementation, all residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

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NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify that the field to be establish in no-till has a soil loss at or below the soil tolerance (T) level for water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E329C

CONSERVATION STEWARDSHIP PROGRAM

No till to increase plant-available moisture

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Criteria

- Residue shall not be burned.
- All residues shall be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value shall be no greater than 20.

CONSERVATION STEWARDSHIP PROGRAM

- Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ During implementation, maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and estimated surface residue cover using the NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a Soil Tillage Intensity Rating value of no greater than 20 for each crop in the planned rotation, and the estimated surface residue cover.
  STIR values for each crop in the rotation = _____

  Estimated surface residue cover for each crop in the rotation = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to the Soil Tillage Intensity Rating value, and estimated surface residue cover to document that the applied rotation met the enhancement criteria.
  STIR values for each crop in the rotation = _____

  Estimated surface residue cover for each crop in the rotation = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329D

CONSERVATION STEWARDSHIP PROGRAM

No till system to increase soil health and soil organic matter content

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Criteria

- All residues must be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Residue must not be burned, grazed, or harvested.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation. The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value shall be no greater than 20.

CONSERVATION STEWARDSHIP PROGRAM

- Evaluation of the cropping system (management) using the current approved soil conditioning index (SCI) procedure results in zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned, grazed, or harvested.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied crop rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating (STIR) values using NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a Soil Tillage Intensity Rating value of no greater than 20 for each crop in the planned rotation.
  STIR values for each crop = _____
- ☐ Prior to implementation, use information provided from the participant and the approved soil conditioning index (SCI) procedure to verify the SCI is zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. **SCI value = _____ and OM subfactor value = _____**
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  STIR values for each crop = _____
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil conditioning index (SCI) and Organic Matter (OM) subfactor values to document that the applied rotation met the enhancement criteria. **SCI value = _____ and OM subfactor value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E329E

CONSERVATION STEWARDSHIP PROGRAM

No till to reduce energy

Conservation Practice 329: Residue & Tillage Management, No Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Criteria

- Residue shall not be burned.
- All residues must be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- No full-width tillage is performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The Soil Tillage Intensity Rating (STIR) value must include all field operations that are performed during the crop interval between harvest or termination of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). Each crop must have a STIR value no greater than 20.

- Reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system. Use the current NRCS wind and water erosion prediction technologies for determining energy use to document energy use reductions.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the current (benchmark) and planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Current (Benchmark) Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Current (Benchmark) Field Operation	Timing of Field Operation (month/year)

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Planned Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no full-width tillage may be performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- ☐ During implementation, reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use the information provided from the participant to calculate the Soil Tillage Intensity Rating values and energy consumption for both the current system and the planned system using the approved NRCS wind and water erosion prediction technologies. Verify the Soil Tillage Intensity Rating value is no greater than 20 for each crop in the planned rotation and total energy consumption is reduced by at least 25%.

  Current STIR values = _____ and Energy Consumption = _____

  Planned STIR values = _____ and Energy Consumption = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if changes were made to the planned crop(s), crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and total energy consumption to document that the applied rotation met the enhancement criteria.

  Applied STIR values = _____ and Energy Consumption = _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E334A

CONSERVATION STEWARDSHIP PROGRAM

Controlled traffic farming to reduce compaction

Conservation Practice 334: Controlled Traffic Farming

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 5 Year

Enhancement Description

Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Criteria

- Ensure that controlled traffic lanes are designed and used in a manner that avoids concentrated flow that may result in gully erosion.
- Limit wheel/track traffic to no more than 25 percent of the soil surface. The same tracks must be used for all high load traffic continually. High wheel load traffic is defined here as any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.
- For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks.
- If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

- Use a Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic when the designated traffic lanes are obscured.
- Once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, develop a plan to limit wheel/track traffic to no more than 25 percent of the soil surface.
- ☐ Prior to implementation, complete the following table to provide the current and any planned changes to crop row width.

Crops in Rotation (shown in sequence)	Current Crop Row Width	Planned Crop Row Width

- ☐ Prior to implementation, complete the following table to provide the current equipment width and spacing used for the above crop rotation.

Equipment Used in Crop Rotation	Width of Equipment (feet)	Tire/Track Spacing (on-center Inches)

- ☐ Prior to implementation, complete the following table to provide any **planned changes** to equipment width and spacing used for the above crop rotation.

Equipment used in Crop Rotation	Width of equipment (feet)	Tire/Track spacing (on-center Inches)

Equipment used in Crop Rotation	Width of equipment (feet)	Tire/Track spacing (on-center Inches)

- ☐ During implementation, the same tracks must be used for all high load traffic continually. High wheel load traffic is any tire or track that bears a load higher than 6,000 pounds at 30 psi or 6 tons per axle.
- ☐ During implementation, use a Geographic Positioning System (GPS) to guide field operations and wheeled/track traffic when the designated traffic lanes are obscured.
- ☐ During implementation, once the tram lines or traffic pattern is established, do not till deeper than 4 inches**.**
- ☐ During implementation, if ruts develop, use tillage or other specialized equipment to remove ruts and reestablish controlled traffic lanes.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the developed plan will limit wheel/track traffic to no more than 25 percent of the soil surface. **Percent wheel/track traffic = _____**
- ☐ Prior to implementation, ensure that controlled traffic lanes are planned and implemented in a manner that avoids concentrated flow that may result in gully erosion.
- ☐ After implementation, verify the plan was implemented to limit wheel/track traffic to no more than 25 percent of the soil surface. **Percent wheel/track traffic = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____
Fiscal Year Completed _____

CONSERVATION STEWARDSHIP PROGRAM

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345A

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce soil erosion

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value ratings shall be no greater than 40, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Use the current approved soil erosion prediction technology for water and wind erosion to determine the:

- Amount of randomly distributed surface residue needed.
- Time of year the residue needs to be present in the field.
- Amount of surface soil disturbance allowed to reduce erosion to the desired level of average annual soil loss.
- Calculations must account for the effects of other practices in the management system.

- In ridge-till systems, plan ridge height and ridge orientation to manage runoff and minimize erosion, with a maximum row grade of 4%.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use the information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 40 for each crop in the planned rotation.

  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345B

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce tillage induced particulate matter

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 40, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Reduce or modify tillage operations that create dust, especially during critical air quality periods.

- Adopt tillage practices that reduce particulate emissions.

CONSERVATION STEWARDSHIP PROGRAM

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

CONSERVATION STEWARDSHIP PROGRAM

☐ Prior to implementation, verify that the field to be establish in no-till has a soil loss at or below the soil tolerance (T) level for water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation.

"T"= _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____

☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
Soil erosion = _____t/ac/year and STIR values = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345C

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to increase plant-available moisture

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- Field must have an annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- The Soil Tillage Intensity Rating (STIR) value MUST include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.

- Maintain a minimum 60 percent surface residue cover throughout the year.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

☐ During implementation, no residue will be burned.

☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.

☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.

☐ During implementation, maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

- ☐ Prior to implementation, use information provided from the participant to calculate the soil loss, Soil Tillage Intensity Rating values, and estimated surface residue cover using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have an annual soil loss at or below the soil tolerance (T) level, a Soil Tillage Intensity Rating value of no greater than 80 for each crop in the planned rotation, and the estimated surface residue cover.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year
  STIR values for each crop in the rotation = _____
  Estimated surface residue cover for each crop in the rotation = _____

- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.

- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information the provided from the participant to calculate soil loss, Soil Tillage Intensity Rating values, and estimated surface residue cover to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year
  STIR values for each crop in the rotation = _____
  Estimated surface residue cover for each crop in the rotation = _____

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345D

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to increase soil health and soil organic matter content

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn residues.
- Field must have an annual soil loss at or below the soil tolerance (T) level for the crop rotation.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop

STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.

- Evaluation of the cropping system using the current approved soil conditioning index (SCI) procedure results in zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation (management SCI value).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, use information provided from the participant to calculate the soil loss and the Soil Tillage Intensity Rating values using current NRCS wind and water erosion prediction technologies. Verify the enrolled field(s) will have an annual soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating value of no greater than 80 for each crop in the planned rotation.
  "T" = _____t/ac/year Soil erosion = _____t/ac/year STIR values = _____
- ☐ Prior to implementation, use information provided from the participant and the approved soil conditioning index (SCI) procedure to verify the SCI is zero or higher and results in a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation. **SCI value = _____ and OM subfactor value = _____**
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil loss and the Soil Tillage Intensity Rating values to document that the applied rotation met the enhancement criteria.
  Soil erosion = _____t/ac/year and STIR values = _____
- ☐ After implementation, if the applied crops, crop rotation, or field operations are different than the planned crops, crop rotation, or field operations, use information provided from the participant to calculate soil conditioning index (SCI) and Organic Matter (OM) subfactor values to document that the applied rotation met the enhancement criteria. **SCI value = _____ and OM subfactor value = _____**

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E345E

CONSERVATION STEWARDSHIP PROGRAM

Reduced tillage to reduce energy use

Conservation Practice 345: Residue and Tillage Management, Reduced Till

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description:

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Criteria:

- Uniformly distribute residues over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- Do not burn crop residues.
- The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous cash crop and harvest or termination of the current cash crop (includes fallow periods). The crop STIR value rating shall be no greater than 80, and no primary inversion tillage implements (e.g. moldboard plow) shall be used.
- Reduce the total energy consumption associated with field operations by at least 25% compared to the benchmark condition. The current NRCS wind and water erosion

prediction technologies must be used for determining energy use to document energy use reductions.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide NRCS with the current (benchmark) and planned crop rotation and tillage operation(s) used for each crop.

Field	Acres	Current (Benchmark) Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Current (Benchmark) Field Operation	Timing of Field Operation (month/year)

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Planned Field Operation	Timing of Field Operation (month/year)

- ☐ During implementation, notify NRCS of any planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ During implementation, no residue will be burned.
- ☐ During implementation, all residues will be uniformly distributed over the entire field. Removing residue from the row area prior to or as part of the planting operation is acceptable.
- ☐ During implementation, no primary inversion tillage implements (e.g. moldboard plow) will be used.
- ☐ During implementation, reduce the total energy consumption associated with field operations by at least 25% compared to the current benchmark tillage system.
- ☐ After implementation, if changes to the rotation were made, complete the tables above to document the applied Conservation Crop Rotation for the contract period and provide to NRCS.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and energy consumption for both the current system and the planned system using the approved NRCS wind and water erosion prediction technologies. Verify the Soil Tillage Intensity Rating value is no greater than 80 for each crop in the planned rotation and total energy consumption is reduced by at least 25%.
  Current STIR values = _____ and Energy Consumption = _____
  Planned STIR values = _____ and Energy Consumption = _____
- ☐ During implementation, evaluate planned changes in crops, crop rotation, or field operations to verify the planned system meets the enhancement criteria.
- ☐ After implementation, if changes were made to the planned crops, crop rotation, or field operations, use information provided from the participant to calculate the Soil Tillage Intensity Rating values and total energy consumption to document that the applied rotation met the enhancement criteria.
  Applied STIR values = _____ and Energy Consumption = _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E381A

Silvopasture to improve wildlife habitat

Conservation Practice 381: Silvopasture Establishment

APPLICABLE LAND USE: Pasture; Forest; Associated Agricultural Land

RESOURCE CONCERN: Plants; Animals

ENHANCEMENT LIFE SPAN: 15 years

Enhancement Description

Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

Criteria

- Tree species and forage species must be adapted to the site and compatible with the planned management of the site.
- No plants on the federal or state noxious weeds list shall be planted.
- Where trees will be added to existing pasture, site preparation should be based on existing vegetation and soil conditions. Trees will be planted at an appropriate density to allow acceptable forage production and wood products.
- If pesticides are used, label recommendations must be followed.
- Only viable, high quality and adapted planting stock or seed will be used.
- Plant nutrients and/or soil amendments for establishment purposes will be applied according to a current soil test. Legume seed will be pre-inoculated or inoculated with the proper viable strain of Rhizobia immediately before planting.

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- Establish forage species and understory shrubs that will provide forage, browse, seed, cover, or nesting habitat for the wildlife species of concern. For additional guidance refer to NRCS Conservation Practice Standards Upland Wildlife Habitat Management (Code 645).
- Favor herbaceous seed mixes that include a diverse mix of native forbs and/or legumes to benefit wildlife including pollinators. Select species that vary in attributes such as timing of flowering, and production of leaves and fruit.
- Plantings will be protected from grazing until an adequate stand is established and meets the species specific, local standard for beginning grazing.

CONSERVATION STEWARDSHIP PROGRAM

Documentation Implementation Requirements

Participant will:

☐ Prior to implementation, select a tree or shrub species for establishment.

Tree or Shrub species	
Trees per acre	
Percent canopy cover	

☐ Prior to implementation, develop a grazing plan to keep grazing periods sufficiently short to allow for plants to recover before re-grazing occurs.

☐ During implementation, keep the following documentation:

- Records and photographs of planting preparation and any materials purchased or materials on hand used for the implementation of the enhancement.
- Documentation of seed (Pure Live Seed) and any fertilizer or soil amendments used for the implementation of the enhancement.

☐ After implementation, make documentation and photographs of livestock turn in/turn out grazing records for each field available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, make the forage planting/or tree planting and grazing records available for review by NRCS to verify implementation of the enhancement.

☐ The State approved NRCS Wildlife Habitat Evaluation Guide (WHEG) as completed and certified by an NRCS or partner wildlife biologist. Wildlife species of concern for the silvopastoral area will be specified on the WHEG. Total WHEG score after installation will equal 0.60 or greater.

NRCS will:

☐ Prior to implementation, complete the State approved NRCS Wildlife Habitat Evaluation Guide (WHEG) as completed and certified by an NRCS or partner wildlife biologist when applicable. Specific pollinator species targeted will be notated on the WHEG, and total

CONSERVATION STEWARDSHIP PROGRAM

score after implementation will equal 0.60 or greater.
WHEG score after implementation = _____

☐ Prior to implementation, verify a grazing plan was developed to keep grazing periods sufficiently short to allow for forages to recover before re-grazing occurs.

☐ Prior to implementation and as needed, NRCS will provide technical assistance:

- Planning site preparation and establishment specifications meeting NRCS Conservation Practice Standard Forage and Biomass Planting (Code 512) or Tree/Shrub Site Preparation (Code 490) and Tree/Shrub Establishment (Code 612).
- Prepare specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- Develop a grazing plan to keep grazing periods sufficiently short to allow for forages to recover before re-grazing occurs.

☐ During implementation, evaluate any planned changes to verify they meets the enhancement criteria.

☐ After implementation, verify the planned perennial planting was established to specifications developed for the site.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

CONSERVATION ENHANCEMENT ACTIVITY

E383A

CONSERVATION STEWARDSHIP PROGRAM

Grazing-maintained fuel break to reduce the risk of fire

Conservation Practice 383: Fuel break

APPLICABLE LAND USE: Forest and Range

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Fuel Break (Code 383) as listed below, and additional criteria as required by the NRCS State Office.

- A fuel break has been constructed around the property or around the targeted site to minimize the risk of damaging wildfires and to enhance the ability to conduct prescribed burning.
- Fuel breaks will be planted with desirable warm-season perennial vegetation as prescribed by local grazing land specialists. Over-seeding with desirable cool season annual forages will take place in the fall.
- The vegetation on the fuel break will be managed using a prescribed grazing plan. Animal stocking levels and rotation periods are designed to manage vegetation and avoid harm to sensitive plants.
- Manage grasses and forbs to minimize fine fuels.

- If trees or shrubs are not sufficiently controlled through grazing management, single-tree treatment with saws or chemicals will be applied.
- If herbicides are used, refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, determine and document the existing fuel breaks on the enrolled acres. Provide as much detail as possible such as length, average width, existing vegetation and past management activities. (NRCS will provide technical assistance, as needed)
- ☐ Prior to implementation, determine and document those sites capable of integrating into a grazing management plan with the establishment of desirable warm-season perennial vegetation and cool season annual forages. (NRCS will provide technical assistance, as needed)
- ☐ Prior to implementation, develop or update a prescribed grazing plan to guide the establishment of forages, animal stocking levels and rotation periods. Provide to NRCS field office. (NRCS will provide technical assistance, as needed)
- ☐ (If prescribed burning is used) Prior to implementation, in combination with grazing to manage vegetation, develop or update a prescribed burn plan to guide the frequency and duration of burning. Provide to NRCS. (NRCS will provide technical assistance, as needed)
    - o Prior to implementation of a prescribed burn, assess the existing fuel load using appropriate tools and methods for the geographic area. Determine the need for pre-treatment of the vegetation and fuels to facilitate a desired fire intensity to achieve the vegetation objectives. Apply as needed, complimentary NRCS Conservation Practice Standards such as Firebreak (Code 394) and Woody Residue Treatment (Code 384) to achieve appropriate conditions. (NRCS will provide technical assistance, as needed)
    - o Prior to implementation, acquire a written burn plan for the enrolled land use acres that meets the NRCS Conservation Practice Standard Prescribed Burning (Code 338) and any additional state NRCS requirements. Provide to NRCS for review and approval.
    - o Prior to implementation of a prescribed burn, acquire all necessary approvals and permits (local, state, federal as applicable).
    - o During implementation, and prior to ignition of each prescribed burn, acquire a current fire weather forecast and ensure all weather conditions are within those prescribed in the written burn plan. If conditions are not within prescription, postpone burn.
    - o During implementation, and prior to ignition of any prescribed burn, notify NRCS to confirm NRCS verification for any planned changes will meet NRCS or State required enhancement criteria.
    - o After implementation of each prescribed burn, conduct a post-burn evaluation as required within the burn plan and provide to NRCS.

CONSERVATION STEWARDSHIP PROGRAM

- During implementation, install and maintain erosion control measures as needed for the site. (NRCS will provide technical assistance, as needed.)
- After implementation, provide NRCS documentation of the vegetation established and timing of grazing activities on the fuel break.

NRCS will:

- Prior to implementation, as needed, provide technical assistance in determining sites for enhancement implementation that meet specified criteria.
- Prior to implementation, NRCS will provide participant recommendations for suitable perennial and annual vegetation establishment and provide assistance in development or revision of a prescribed grazing plan.
- Prior to implementation, as needed, provide explanation and technical assistance to the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - Prescribed Burning (Code 338).
  - Fuelbreak (Code 383).
  - Firebreak (Code 394).
  - Woody Residue Treatment (Code 384).
  - Integrated Pest Management (Code 595).
  - Additional Conservation Practice Standards for erosion control, as needed for the site.
- (If prescribed burning is used) Prior to implementation, review and certify the prescribed burn plan meets the enhancement criteria and any additional state NRCS requirements.
- Prior to implementation, review the prescribed grazing plan to ensure objectives of the enhancement will be met when used in combination with all other practices.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- (If prescribed burning is used) After implementation of each prescribed burn, review the post burn evaluation provided by the participant. Discuss any encountered issues, and as needed, provide assistance for changes in planning and procedure for the remaining prescribed burns.
- After implementation, review documentation of the vegetation established and timing of grazing activities on the fuel break to verify the enhancement was implemented to meet the enhancement criteria.

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E391A

CONSERVATION STEWARDSHIP PROGRAM

Increase riparian forest buffer width for sediment and nutrient reduction

Conservation Practice 391: Riparian Forest Buffer

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial) and Associated Ag Land

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 15 Years

Enhancement Description

Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Criteria

- Existing buffer width shall be at least 35 feet or (if applicable) the minimum State buffer-width requirement, whichever is greater. Maximum enhancement buffer width may be increased up to the greater of 180 feet or the State-allowed maximum width.
- To the extent possible, the buffer area and extended buffer will be shaped and vegetated to increase overland flow interception.
- Excessive sheet-rill and concentrated-flow erosion will be controlled in the areas immediately adjacent and up-gradient of the buffer site. Overland flow through the riparian area will be maintained as sheet flow.

- Existing functional underground drains through the riparian area will be plugged, removed or replaced with perforated pipe/end plugs or water control structures.

- Dominant vegetation will consist of existing, naturally regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site and the intended purpose of nutrient reduction.

- Use tree and shrub species that are native and non-invasive. Substitution with improved and locally accepted cultivars or purpose-specific species is allowed. For plantings and seeding, only viable, high-quality and adapted plant materials will be used.

- Favor tree and shrub species that have multiple values such as those suited for timber, nuts, fruit, florals, browse, nesting, and aesthetics.

- Periodic removal of some forest products such as high value trees, medicinal herbs, nuts, and fruits is permitted provided the buffer area is not compromised by the loss of vegetation or harvesting disturbance.

- Necessary site preparation and planting shall be done at a time and manner to insure survival and growth of selected species.

- Harmful plant and animal pests present on the site will be controlled or eliminated as necessary to achieve and maintain the intended purpose. Pest management will be conducted in a manner that mitigates impacts to pollinators.

- Livestock shall be controlled or excluded as necessary to achieve the buffer's water quality improvement purpose. If livestock is present, follow a Prescribed Grazing Plan (CPS 528) and defer grazing for a minimum of two years.

- Design the expanded buffer enhancement for an expected life of at least 15 years.

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, prepare the planned buffer area according to the planting plan NRCS has developed with you. Refer to NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391). (NRCS will provide technical assistance)

☐ Prior to implementation, select planting date, method, and density/spacing appropriate for the site and soil conditions. (NRCS will provide technical assistance.)

Planting Date	
Planting Method	
Density and spacing	

☐ Prior to implementation, work closely with NRCS to select plant species that are adapted to your specific site and meet the goals of this enhancement.

Species	Vegetative or Rootstock	Size	Protection (tubes, mats, nets)

☐ During implementation and before planting, grade the site, as needed, to eliminate concentrated flow through the buffer including water coming from uphill of the buffer.

☐ During implementation and before planting, replace underground tile drains that pass through the buffer with rigid, non-perforated pipe or install a water control device that allows for overflow management.

☐ During implementation, install and maintain erosion control measures as needed, such as silt fencing and mulching.

☐ During implementation, conduct planting of selected species according to dates, methods, spacing and other requirements listed in the planting plan.

☐ During implementation, notify NRCS of any planned changes to allow NRCS to verify that the changes meet NRCS enhancement criteria.

- ☐ After Implementation, control harmful pests and vegetation and in a manner that limits effects to pollinators. Inspect and maintain tubes and protection measures regularly.

- ☐ After implementation, livestock and wildlife may need be controlled or excluded to achieve the buffer's water quality improvement purpose. If livestock are present, follow a Prescribed Grazing Plan (Code 528) and defer grazing for a minimum of two years. Wildlife may need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.

NRCS will:

- ☐ Prior to implementation, verify the enhancement is planned for cropland.

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391) to show how it relates to this enhancement.

- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included in the planting list.

- ☐ Prior to implementation, NRCS will provide technical assistance on:

    - Preparing a site preparation and planting plan that meets NRCS Conservation Practice Standard Riparian Forest Buffer (Code 391) and lists the species, vegetation type, density, protection measures, and planting dates.

    - Selecting planting techniques and timing appropriate for the site and soil conditions.

    - Assessing impacts of drainage removal/plugging on adjacent land units and uses.

    - Preparing specifications for applying this enhancement for each site using approved state implementation requirements, national technical notes, appropriate state technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- ☐ During implementation, review any planned changes to ensure they meet the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications provided to the participant.
- ☐ After implementation, verify that any underground drains through the riparian area, if they exist, were plugged, removed or replaced with perforated pipe/end plugs or structures for flow control.
- ☐ After implementation, verify the vegetation was established and any protections required are being maintained according to the specifications provided to the participant.
- ☐ After implementation verify livestock are controlled or excluded as necessary to achieve the buffer's water quality improvement purpose. If livestock are present, verify a Prescribed Grazing Plan (Code 528) is being followed and that grazing is being deferred for a minimum of two years.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449A

CONSERVATION STEWARDSHIP PROGRAM

Complete pumping plant evaluation for water savings

CONSERVATION PRACTICE: 449 - Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 years

Enhancement Description

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more.

Criteria

- Pump test evaluation will include all irrigation pumps on fields where the activity is implemented. There could be multiple pumps that are used on single or multiple fields.

- Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season.
  - Pressure at different flow rates based on partial or complete irrigation.
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated.
  - Estimate of friction loss in pipelines based on pressure drop in lines during test.

- The irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice, Irrigation Water Management (Code 449):
  - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
  - Methods used to measure or determine the flow rate or volume of the irrigation applications.

- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- The Irrigation water management plan explains:
  - How irrigation system meets crop needs, while maximizing irrigation water efficiency.
  - Seasonal or annual planned water application volumes by crop.
  - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
  - Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
  - Information on how to recognize irrigation induced erosion and how to mitigate it.
  - Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
  - Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station
- Recordkeeping documents for the irrigator to use during operation and management.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.

- ☐ Arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.

- ☐ Acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.

CONSERVATION STEWARDSHIP PROGRAM

During implementation

- ☐ Follow the irrigation water management plan and keep records as required by the plan.
- ☐ Have a pump test evaluation performed on all irrigation pumps on fields where activity is implemented.

After implementation

- ☐ Make the following items available for review by NRCS to verify implementation of the enhancement:
  - Irrigation water management plan and records kept.
  - Pump test evaluation report(s).
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation. Calculate the reduction of water use based on before and after conditions.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) to participant as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.

After implementation

- ☐ Verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E449C

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 2-5, soil moisture monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

Criteria

Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

- An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
- Methods used to measure or determine the flow rate or volume of the irrigation applications.
- Measurement records showing the amount of water used to irrigate as it comes onto the farm and goes to each field.
- Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
- Irrigation water management plan explains:

- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- How data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station

- Recordkeeping documents for the irrigator to use during operation and management.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (449) requirements.

- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.

- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
  - o Irrigation water management plan and records kept
  - o Changes made to address distribution uniformity deficiencies

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (CPS 449) as it relates to implementing this enhancement

- ☐ As needed, provide additional technical assistance to the participant as requested.

- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing participant records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449D

CONSERVATION STEWARDSHIP PROGRAM

Advanced Automated IWM – Year 1, Equipment and soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management

Criteria

- Equipment may include; weather station, sensors, flow meter, data loggers, cellular service, as needed to monitor soil moisture, determine and forecast crop water use and remotely control irrigation system.
- Subscription service provided by others may be used as an alternative.
- Data to be monitored includes crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment, and a data logger to log continuous weather data including rainfall, temperature, solar radiation, humidity, wind

speed and soil moisture/water level sensors data that can be downloaded to a personal computer and associated graphing software.

- Producer monitors the station during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensors, field checks and weather station data.

- Producer keeps records of collected data and resulting irrigation decisions. This enhancement only applies to year one of IWM. The appropriate labor-only IWM enhancements apply in subsequent contract years.

- If a weather station is installed, install within 1 mile of fields where practice is implemented. The weather station will record each of the following (at a minimum of four times per hour),
    - o High and low temperature
    - o Precipitation
    - o Humidity
    - o Wind speed and duration
    - o Solar radiation

- Sensors, datalogger and required telemetry are installed on fields where practice is implemented as indicated in the Irrigation water management plan.

- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - o An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture locations and depths (if used), and soils. If water level sensors are used, show locations and number of sensors used.
    - o Methods used to measure or determine the flow rate or volume of the irrigation applications.
    - o Measurement records showing the amount of water used to irrigate, as it comes onto the farm and goes to each field.
    - o Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
    - o The Irrigation water management plan explains;

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- How irrigation system meets crop needs, while maximizing irrigation water efficiency.
- Seasonal or annual planned water application volumes by crop.
- Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.
- Evaluation of irrigation system distribution uniformity and necessary changes to insure uniform irrigation.
- Information on how to recognize irrigation induced erosion and how to mitigate it.
- Indicate how data from the sensor locations and depths will be considered to make field-wide irrigation decisions.
- Water application scheduling based on soil moisture or water level monitoring and or evapotranspiration monitoring from the weather station.

o Recordkeeping documents for the irrigator to use during operation and management

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- ☐ Prior to implementation, acquire NRCS approval of selected weather station, sensors, data logger, etc. or subscription service.
- ☐ During implementation, ensure installation meets manufacturer recommendations.
- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
    - o Irrigation water management plan and records kept (i.e. , date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data)
    - o Changes made to address distribution uniformity deficiencies
    - o Documentation of equipment installed (i.e. weather station, sensors, data logger, etc.) to NRCS
    - o If a suscription service is used, provide location of equipment, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement
- ☐ As needed, provide additional assistance to the participant as requested.
- ☐ Prior to implementation, review and approve producer's selected weather station, sensors, data logger, etc. or subscription service.

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- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ After implementation, verify installation of weather station, sensors, etc.
- ☐ After implementation, verify implementation of the irrigation water management plan, by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449F

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Year 1, Equipment with Soil moisture or Water Level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

This activity involves monitoring soil moisture or water levels within a surface irrigated field for intermediate irrigation water management by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment is installed and utilized to log data and retrieve the data periodically throughout the season, so irrigation decisions can be made based on scientific data. Maximum time between data retrievals is weekly.

Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.

Criteria

General

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall,

temperature; water level sensor with data collection system; permanent flowmeter

- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- The installation includes the purchase and installation of equipment with data collection systems that can continuously record data throughout the irrigation season.
- Irrigation water management plan is followed and includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used) and soils.
    - Method used to measure or determine the flow rate or volume of the irrigation water applications
    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field
    - Documentation of the scientific method used to schedule the timing and amount of irrigation application
    - Irrigation water management plan explaining:
        - How irrigation meets crop needs while maximizing irrigation water efficiency
        - Seasonal or annual planned water application volumes by crop
        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth
        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation
        - Information on how to recognize irrigation induced erosion and how to mitigate it
        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions
        - Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station

- Recordkeeping documents for the irrigator to use during the operation and management

CONSERVATION STEWARDSHIP PROGRAM

Additional Criteria of soil moisture devices

- Installation of each soil moisture set will include the ability to collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region
- Number of soil moisture sets will be installed based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of flow measurement devices

- Permanent flow meters will be installed at all wells/relifts that are included in the approved IWM plan

Additional Criteria of water level devices

- Sensor is installed in a basin field with a data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day

Additional Criteria of weather stations

CONSERVATION STEWARDSHIP PROGRAM

- Weather station is installed in a central location as defined by the irrigation water management plan, but no more than 2 miles separation

- Weather stations will record each of the following at a minimum of four times per hour:
  - High and low temperature
  - Precipitation
  - Humidity
  - Wind speed and duration and direction
  - Solar radiation

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- Acquire an irrigation water management plan meeting NRCS Conservation Practice Irrigation Water Management (Code 449) requirements
- Acquire NRCS approval of all irrigation water management devices that will be utilized for the plan implementation

During installation or implementation

- Ensure each irrigation water management device is installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- Monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data

After implementation

- Make the following items available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan is followed, and records kept
    - Changes made to address distribution uniformity deficiencies
    - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation

NRCS will:

Prior to implementation

- Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement

CONSERVATION STEWARDSHIP PROGRAM

- Provide additional assistance to the participant as requested
- Review and approve producer's selected equipment After Implementation
- Verify installation of all irrigation water management equipment
- Verify implementation of the irrigation water management plan by:
    - Reviewing records kept during enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449G

CONSERVATION STEWARDSHIP PROGRAM

Intermediate IWM— Years 2-5, Soil Moisture or Water Level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment was bought in year one and is utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly.

Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.

Criteria

General

- Equipment may include: soil moisture sensor with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system

- Data to be monitored includes: irrigation water applied, crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions.
- Irrigation water management plan from year one is followed in accordance to the NRCS Conservation Standard Practice Irrigation Water Management (Code 449):
    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used) and soils.
    - Method used to measure or determine the flow rate or volume of the irrigation water applications
    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field
    - Documentation of the scientific method used to schedule the timing and amount of irrigation application
    - Irrigation water management plan explaining:
        - How irrigation meets crop needs while maximizing irrigation water efficiency
        - Seasonal or annual planned water application volumes by crop
        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth
        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation
        - Information on how to recognize irrigation induced erosion and how to mitigate it
        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions
        - Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station
    - Recordkeeping documents for the irrigator to use during the operation and management

Additional Criteria of soil moisture devices

- Each year re-install the soil moisture set to collect data at a minimum of 2 approved

depths based on crop and soil characteristics of the region

- Number of soil moisture sets will be installed based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of water level devices

- Re-install sensor/gage each year in a basin field with a data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation

- Review the irrigation water management plan to make any necessary adjustments from the previous year.
- Ensure the irrigation water management plan continues to meet the NRCS Conservation Practice Irrigation Water Management (Code 449) requirements.

During installation or implementation

- Ensure each irrigation water management device is re-installed to manufacturer recommendations
- Record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data
- Monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data

After implementation

- Make the following items available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan is followed, and records kept
    - Changes made to address distribution uniformity deficiencies
    - Utilization documentation of any sensor used throughout the growing season as well as certification of their proper installation

NRCS will:

Prior to implementation

- Provide and explain NRCS Conservation Practice Standard Irrigation Water

Management (Code 449) as it relates to implementing this enhancement

- Provide additional assistance to the participant as requested After Implementation
- Verify re-installation of all irrigation water management equipment each year
- Verify implementation of the irrigation water management plan by:
    - Reviewing records kept during each year of enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E449H

Intermediate IWM— Years 2 -5, using soil moisture or water level monitoring

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Monitoring soil moisture or water levels within an irrigated field for implementing an intermediate irrigation water management plan using soil moisture data to facilitate management decisions.

Criteria

- Equipment previously installed (through preceding enhancement) must include soil moisture sensors with data collection systems; weather stations that collect solar radiation, wind speed and direction, rainfall, temperature; water level sensor with data collection system; and permanent flowmeter.
- Monitoring of the following items required:
    - Irrigation water applied
    - Crop water use
    - Status of heat and/or frost conditions to permit the producer to make informed irrigation decisions

CONSERVATION STEWARDSHIP PROGRAM

- Perform regular maintenance and monitoring of equipment with data collection systems that continuously record data throughout the irrigation season.

- Follow an irrigation water management plan which includes, as per NRCS Conservation Standard Practice Irrigation Water Management (Code 449):

    - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor/water level sensor locations (if used), and soils.

    - Method used to measure or determine the flow rate or volume of the irrigation water applications.

    - Measurement records showing the amount of water used to irrigate as it comes on to the farm and goes into each field.

    - Documentation of the scientific method used to schedule the timing and amount of irrigation application.

    - Irrigation water management plan explaining:

        - How irrigation meets crop needs while maximizing irrigation water efficiency.

        - Seasonal or annual planned water application volumes by crop.

        - Management allowable depletion (MAD) and depth of the managed crop root zone or water level for each crop and stage of growth.

        - Evaluation of irrigation system distribution uniformity and necessary changes to ensure uniform irrigation.

        - Information on how to recognize irrigation induced erosion and how to mitigate it.

        - Indicate how data from the sensor location and depths will be considered to make field-wide irrigation decisions.

- Water application scheduling based on soil moisture or water level monitoring and/or evapotranspiration monitoring from the weather station.

  - Record keeping documents for the irrigator to use during the operation and management.

Additional Criteria of Soil Moisture Devices

- Soil moisture sensors collect data at a minimum of 2 approved depths based on crop and soil characteristics of the region.
- Number of soil moisture data sets will be based on the irrigation water management plan designed per water source using the following criteria: field topography, crop rotation and the soils throughout the field.

Additional Criteria of Flow Measurement Devices

- Permanent flow meters data collected at all wells/relifts that are included in the approved IWM plan.

Additional Criteria of Water Level Devices

- Data from sensors installed in a basin field from data logger with the ability to capture an image of the movement of the gauge. Images are captured at a minimum of twice a day.

Additional Criteria of Weather Stations

- Weather station data from a central location as defined by the irrigation water management plan
- Weather station record includes each of the following at a minimum of four times per hour:
  - High and low temperature
  - Precipitation

- Humidity
- Wind speed and duration and direction
- Solar radiation.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, acquire an irrigation water management plan meeting NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements.
- ☐ During implementation, ensure each irrigation water management device functions as intended.
- ☐ During implementation, record irrigation data such as location, date, duration, and flow rate of all irrigation operations, rainfall, evapotranspiration, and soil moisture or water level data.
- ☐ During implementation, monitor the devices during the growing season to determine timing and amounts of water to apply based on soil moisture/water level sensor, field checks and weather data.
- ☐ After implementation, make the following documentation available for review by NRCS to verify implementation of the enhancement:
    - Irrigation water management plan and associated records.
    - Changes made to address distribution uniformity deficiencies.
    - Documentation demonstrating utilization of any sensor used throughout the growing season.

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) requirements as it relates to implementing this enhancement, including applicable state specific job sheets.
- ☐ Prior to implementation, assist with data interpretations needed for management decision making.
- ☐ Prior to implementation, provide additional assistance to the participant as requested.

☐ After implementation, verify implementation of the irrigation water management plan by reviewing records kept during enhancement implementation.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E449I

CONSERVATION STEWARDSHIP PROGRAM

IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation System

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

This enhancement consists of retrofitting an existing sprinkler irrigation system to integrate variable rate irrigation (VRI) speed control where the technology is not present. The added functionality of VRI speed control equipment allows for enhanced water application precision, efficiency, and uniformity along the length of the sprinkler irrigation system by varying the irrigation system speed within the irrigation pass. Renovation of the existing sprinkler irrigation system utilizing this enhancement includes the installation of an upgraded control panel capable of speed control programming and global positioning system (GPS) technology capable of providing real-time field position. Utilization of the VRI speed control and GPS equipment will be for the entire irrigation season and be based on spatially identified parameters such as variations in past yield data, soils, crop growth, topography, or computerized irrigation scheduling recommendations. This scenario requires that the existing sprinkler irrigation system meets Conservation Practice Standard (CPS) 442 uniformity and efficiency requirements. System equipment is installed in year 1 with this scenario and scenario E449G or E449C is used in years 2-5.

Criteria

- Documentation that ensures the speed control devices are compatible with the existing sprinkler irrigation system.
- Detailed drawings on how the speed control and GPS devices will connect to the existing sprinkler irrigation system, operate safely, and be protected.
- Irrigation water management (IWM) plan that follows the NRCS Conservation Practice Standard Irrigation Water Management (CPS449).
- The installation includes the purchase and installation of speed control and GPS devices. Components necessary for retrofit depend on the type of devices are installed and sprinkler irrigation system being renovated, but should consist of speed control and GPS devises as indicated below:

- Speed control unit with percentage timer setting capable of varying the irrigation system speed within the irrigation pass. Sprinkler irrigation tower speed is controlled by contactor coil voltage sent out by the percentage timer within the control panel.
- Satellite-guided GPS technology mounted on the sprinkler irrigation system provides real-time end tower location, speed, and direction information to the control panel.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Acquire an IWM plan meeting NRCS CPS Irrigation Water Management (Code 449) requirements.
- ☐ Develop a map delineating the location of the existing sprinkler irrigation system, speed control unit, satellite-based technology, and the fields they serve.
- ☐ Acquire NRCS approval of selected of selected speed control unit and satellite-based technology.

During implementation

- ☐ Ensure installation meets manufacturers recommendations.
- ☐ Provide documentation ensuring that the speed control device, GPS device, and supporting appurtenances allow the sprinkler irrigation system to operate safely and in the range of design operating conditions.
- ☐ Provide documentation of the protective structures meeting the requirements of the speed control and GPS devices. Ensure that the protective devices meet NRCS standards.
- ☐ Record each irrigation event, including the amount or depth of water applied, duration of the event, date of application, and any other requirements of the approved IWM Plan.

After implementation

- ☐ Copy of the record of each irrigation event, including the amount or depth of water applied, duration of the event, date of application, and any other requirements of the approved IWM plan.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code 449) as it relates to implementing this enhancement.
- ☐ Provide and explain NRCS Conservation Practice Standard Sprinkler System (Code442) as it relates to implementing this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Provided additional assistance to the participant as requested.

- ☐ Review and approve producer's selected equipment

During Implementation

- ☐ Provide additional assistance to the participant as requested.

After Implementation

- ☐ Verify installation of the speed control devices, GPS devices, and supporting appurtenances are in accordance with manufacturer's specification.
- ☐ Verify that speed control and GPS devices are compatible with the existing sprinkler irrigation system.
- ☐ Verify implementation of the approved IWM plan by reviewing records kept during enhancement implementation.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484A

Mulching to improve soil health

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health – increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical, and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least four different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Criteria

- Use plant-based mulching materials of suitable quantity and quality to add organic matter, provide food and shelter for soil biota, and protect the soil surface from raindrop impact and crusting while allowing for adequate soil aeration.
- Apply plant-based mulching materials with a carbon to nitrogen ratio (C:N) less than 30 to 1 to reduce soil nitrogen immobilization by soil biota (typical ratio examples – hairy vetch cover crop 11:1, fresh grass clippings 17:1, mature alfalfa hay 25:1, corn stalks 60:1, wheat straw 80:1, and pine needles 80-110:1).
- Do not apply mulch with C:N less than 20:1 to an area of designed flow in watercourses.

CONSERVATION STEWARDSHIP PROGRAM

- The crop rotation includes at least four crops and/or cover crops grown in a sequence.
- An evaluation of the system using the current approved SCI procedure results in zero or higher.
- Use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with the planned crop rotation and tillage operation(s) used for each crop. The crop rotation must include at least four crops and/or cover crops grown in a sequence.

Field	Acres	Planned Crops (in sequence)	Length of Crop Rotation (years)

Field	Crop	Field Operation	Timing of Field Operation (month/year)

☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Application Date

☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

CONSERVATION STEWARDSHIP PROGRAM

☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

☐ If changes were made to crop rotation or tillage operation(s) after implementation, complete the tables above to document the changes.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, verify that the crop rotation includes at least four crops and/or cover crops grown in a sequence.

☐ Prior to implementation, use information provided from the participant to calculate the Management SCI value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**

☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to verify the planned system meets the enhancement criteria.

☐ If changes were made from the planned system after implementation, use information provided from the participant to calculate Management SCI value to document that the applied system met the enhancement criteria. **Management SCI Value = _____**

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E484B

Reduce particulate matter emissions by using orchard or vineyard generated woody material as mulch

Conservation Practice: 484 Mulching

APPLICABLE LAND USE: Crop (perennial)

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Reduce particulate matter emissions by using orchard- or vineyard-generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. *An exception may be made when it is determined that infected material must be burned to preserve crop health.*

Criteria

- Non-infected, woody material will not be burned, but instead will be chipped and used as mulch. Infected material may be burned to preserve crop health, but 90% of all woody material must be mulched in order to count this enhancement as met.
- When mulching with wood products such as wood chips, bark, shavings, or other wood materials, apply a minimum two-inch thickness of particles that will remain in place during heavy rainfall or strong wind events, or both, if applicable.
- Mulching plan must be developed. Mulched material must meet guidelines laid out in a mulching plan for size of chips and thickness of cover applied.
- Mulch does not have to be applied to the immediate source area (orchard or vineyard), but instead may be applied anywhere needed on the operation that is designated in the mulching plan (e.g., other areas of farmstead or cropland).
- Avoid excessively thick or tightly packed mulches that can results in soggy, anaerobic conditions at the soil surface during wet weather or prevent rainfall or

overhead irrigation from reaching the soil during times of moisture deficit.

- Keep mulch three to six inches away from plant stems and crowns to prevent disease and pest problems. Additional weed control may be needed around the plant base area.
- For all organic or transitioning-to-organic operations, follow all National Organic Program (NOP) rules.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, provide NRCS with information for review about current and proposed management of orchard or vineyard generated woody materials.

Field	Crop	Acres	Current Management	Proposed Management

☐ Prior to implementation, provide NRCS with the proposed mulching plan for development. NRCS can provide assistance, as needed, in plan development. At a minimum, the plan must include:

- Purpose of mulching
- Type of mulch material
- Approximate amount of mulch material to be utilized
- Size of mulch pieces (size range or maximum size of pieces)
- Placement timing (planned and actual)
- Depth of mulch cover
- Any required site preparation
- Operation and maintenance information
- Map(s) of area where material is to be applied

Field	Crop/Location	Mulching Material	Planned Mulching Depth or Rate of Application (inches or pounds/acre)	Planned Application Date

- ☐ During implementation, notify NRCS of any planned changes in the mulching plan to verify changes meet the enhancement criteria.

- ☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.

- ☐ During implementation, take photos of area mulched that document the average size of mulched material and depth of layer applied.

- ☐ After implementation, provide NRCS with the applied mulching information.

Field	Crop	Mulching Material	Actual Mulching Depth or Rate of Application (inches or pounds/acre)	Actual Application Date

- ☐ After implementation, provide mulching plan and photos for review of the area(s) mulched to document the average size of mulched material and depth of layer applied and to verify the planned system meets the enhancement criteria.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.

- ☐ Prior to implementation, review current and proposed management of orchard- or vineyard-generated woody materials. *Plan/contract the actual acres of the crop producing the woody materials to be managed.*

- ☐ Prior to implementation, verify that the mulching plan meets all criteria of the enhancement.

- ☐ During implementation, evaluate any planned changes in the mulching plan to ensure enhancement criteria are met.

- ☐ If changes were made after implementation, use information provided from the participant to verify the applied system meets the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E484C

CONSERVATION STEWARDSHIP PROGRAM

Mulching with natural materials in specialty crops for weed control

Conservation Practice 484: Mulching

APPLICABLE LAND USE: Crop (annual & mixed), Crop (perennial)

RESOURCE CONCERN ADDRESSED: Plants

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Application of straw mulch or other state-approved natural material (such as wood chips, compost, green chop, dry hay, or sawdust) for weed control in specialty crops.

Criteria

Use mulch of sufficient ground cover, thickness, and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests. Mulch thickness will be determined by the size of the plant being mulched. Thickness of the mulch shall be adequate to prevent emergence of targeted weeds, but no less than four inches deep for dry mulches.

Grass-based green chop should be applied no greater than three inches deep as it will compact and rot. Add additional layers of green chop as decomposition occurs to maintain weed control. Do not use green chop from areas recently treated with herbicides.

Mulches shall be kept a minimum of three inches away from the stems of plants where disease is likely to occur. Depending on the crop, mulch distance may need to be up to six inches away from the stems.

Mulches applied around growing plants or prior to weed seedling development shall have 100%ground cover.

Avoid finely divided residues (e.g. sawdust) and those rich in soluble carbohydrates (e.g. fresh chopped corn or other grasses) with a carbon to nitrogen ratio (C:N) greater than 30 that tie up soil nitrogen (N) and necessitate supplemental N applications.

Avoid excessively thick or tightly packed mulches that can interfere with the movement of ground beetles and other beneficial organisms and may result in soggy, anaerobic conditions at the soil surface and increase the incidence of crop pests and diseases.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide a map showing location of mulch application.
- ☐ Prior to implementation, provide NRCS with the planned mulching information. Select crops to be mulched, mulching materials, and rates of application that will provide weed suppression and do not contribute to pest problems.

Field	Crop	Mulching Material	Planned Rate of application (pounds/acre)	Planned Depth of Mulch (inches)	Planned Application Date

- ☐ During implementation, notify NRCS of any planned changes in the cropping system, crop management, or mulching to ensure enhancement criteria are met.
- ☐ During implementation, take photos of mulch after application, during the growing season, and at harvest.
- ☐ During implementation, use mulch of sufficient ground cover and suitable thickness and texture to provide habitat for ground beetles, spiders, and other predators of weed seeds and crop pests.
- ☐ During implementation, maintain all receipts or other records showing the quantity of mulch used.
- ☐ After implementation, provide NRCS with the applied mulching information and any additional information related to the mulching impacts on weed control or crop production.

Field	Crop	Mulching Material	Actual Rate of application (pounds/acre)	Actual Application Date

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify mulching materials to be used, depth of mulch, and quantity needed, and document on implementation requirements.
- ☐ Prior to implementation, use information provided from the participant to calculate the Management Soil Conditioning Index (SCI) value using current NRCS wind and water erosion prediction technologies. **Management SCI Value = _____**
- ☐ During implementation, evaluate any planned changes in the cropping system, crop management, or mulching to ensure enhancement criteria are met.
- ☐ After implementation, review the applied mulching information and records and recommend adjustments to the mulch specifications for subsequent years based on success of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E511C

CONSERVATION STEWARDSHIP PROGRAM

Forage testing for improved harvesting methods and hay quality

Conservation Practice 511 Forage Harvest Management

APPLICABLE LAND USE: Perennial cropland (hayland) and Pasture

RESOURCE CONCERN: Animals, Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Dry hay forage samples are collected and analyzed following LGU procedures. Analysis results are kept and used to improve harvest decisions to guide forage supplementation of on-farm livestock to meet nutritional needs and improve health and productivity.

Criteria

- This enhancement only applies to hay harvested on-farm.
- Develop a plan to harvest hay in a manner that protects stand longevity and maintains or improves forage quality. Plans must include specifications for harvest timing, handling prior to baling, and storage options to best preserve forage quality.
- At least **2 consecutive** cuttings will be required of the same forage type, but additional testing may be needed and should follow the Cooperative Extension or other specialist/nutritionists' recommendations and documented in the plan.
- Collect hay samples consistent with land grant university or accredited lab protocol for tissue sampling for each harvest cycle. Consult the National Forage Testing Association list of Certified Labs- https://www.foragetesting.org/links for more assistance.

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- Complete a record keeping document that will include all the following at a minimum for each cutting:
    - Date and time of harvest AND date of baling
    - Forage type
    - Maturity stage/description during harvest including harvest height
    - Curing and handling prior to baling (number of tedding, raking, and/or merging operations)
    - Moisture during harvest
    - Bale type (Large square, Round, Small Square)
    - Storage type (indoor, poly-wrapped, tubed, tarped, net wrapped, unprotected etc.)
    - Crude protein
    - Fiber (NDF/ADF)
    - Ash
    - Total Digestible Nutrients (TDN)
    - Relative feed value (RFV)
    - Additional recommended tests (where available): NDF-Digestibility (30-hour recommended) and nitrates.
- Provide record keeping documents and hay test results to NRCS office.
- Discuss results with local Cooperative extension educator or livestock nutritionist, provide any recommendations to NRCS office for all harvesting cycles.
- Use results to improve harvesting decisions.
- Use hay analyses to guide forage supplementation to on-farm livestock.

Adoption Requirements

This enhancement is considered adopted when the criteria is met, and documentation records are provided.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, develop a map delineating the fields selected for gathering the hay analysis and record keeping documentation.
- ☐ Prior to implementation, ensure forage harvesting tool/machinery is capable of cutting the forage at the desired residual height without compromising plant vigor and stand longevity.
- ☐ Prior to implementation, develop a plan to harvest hay in a manner that protects stand longevity and maintains or improves forage quality and maintains adequate stubble. Plans must include specifications for harvest timing, handling prior to baling, and storage options to best preserve forage quality. Refer to NRCS Conservation Practice Standard Forage Harvest Management (Code 511).
- ☐ Prior to implementation, provide the forage harvest and forage sampling plan to NRCS for review. Two consecutive cuttings of the same forage type will be evaluated, preferably on the same field, unless the first harvested species will be different than the second harvest on the same field, (for example cool season species fields that transition to warm season forage later in the season). The first cutting must be tested after harvest and is one of the two required. Management decisions must be made from the first test to determine how to improve forage quality for the next cutting. Record keeping should be completed for each cutting and a report completed. Additional testing may be needed and should follow the Cooperative Extension or other specialist/nutritionists' recommendations and documented in the plan.
- ☐ During implementation, collect the number of forage samples on mapped field/s during each harvest cycle and send to a land grant university or accredited lab for tissue analysis.
- ☐ During implementation, keep records including all items under criteria.
- ☐ During implementation, discuss results and implement technical recommendations from Cooperative Extension, nutritionist or NRCS.

- ☐ During implementation, use analysis results and data to improve/adjust forage harvesting activities for the next harvest cycle.

Example: Ash content above internal sources (calcium, magnesium, potassium, phosphorus); adjust cutting and/or rake heights to reduce external sources (dirt, bedding, etc.), use cutting heights and harvest timing to positively affect fiber level, change harvest timing to increase protein and NDF-d levels etc.

- ☐ During implementation use data collected from on-farm hay analysis to improve supplemental feeding periods for animals' health and productivity.
- ☐ After implementation, provide tissue analysis and all record keeping documentation to NRCS
- ☐ After implementation, provide technical recommendations from Cooperative Extension or other specialist/nutritionist to NRCS.
- ☐ After implementation, provide report on how the data enabled improvements to hay harvest and feed supplementation efficiency.

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Forage Harvest Management (Code 511) as it relates to this enhancement.
- ☐ Prior to implementation, verify map and crop/hayfields where enhancement will apply.
- ☐ Prior to implementation, provide assistance in determining the forage cutting to be sent for analysis in addition to the required first cutting.
- ☐ Prior to implementation, provide assistance in determining the planned number of hay samples above the required 2.

- ☐ During implementation, verify management changes in harvest management have positively affected test values in the forage analysis results. Positive effects are but not limited to increases in crude protein levels, NDF-D and TDN values and/or lowering of NDF/ADF and Ash levels.

- ☐ After implementation, verify the hay harvest and hay analysis activities and record keeping meet the specifications of this enhancement.

- ☐ After implementation, review data driven report for hay harvest and supplemental feeding improvements.

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CONSERVATION ENHANCEMENT ACTIVITY

E528C

CONSERVATION STEWARDSHIP PROGRAM

Incorporating wildlife refuge areas in contingency plans for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

Criteria

- A written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife will be followed.
- Enhance diversity of rangeland plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
  - Clear objectives,
  - A resource inventory of structural improvements, existing resource conditions, and forage inventory.
  - Grazing plan, and

  - A contingency plan
  - A monitoring plan

- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Identify wildlife species of concern in the objectives of the prescribed grazing plan.
- An area that constitutes at least 15% of the planned enhancement acreage (or a minimum of ten acres, whichever is larger) that is predominantly native grasses and/or legumes and/or perennial forbs will be rested from all harvest by livestock or prescribed burning for a period of 12 months or longer.
- The rested area must be a grazing unit (or located in a grazing unit) that scores a minimum of 0.5 on the state NRCS Wildlife Habitat Evaluation Guide (WHEG).
- The rested area can be used to stockpile forages to build reserves for livestock forage after the 12-month rest period.
- In the event the designated refuge area gets utilized by livestock during a drought/disaster emergency or other contingency situation, during the life of the contract, it must be restored or let recover or another pasture designated and rested for 12 months following the emergency utilization.
- Water must be made available for the wildlife species of concern designated in the grazing plan in the refuge area or nearby where the refuge provides needed cover for water access.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, review NRCS Conservation Practice Standards Prescribed Grazing (Code 528) and Upland Wildlife Habitat Management (Code 645), including any state approved job sheets or work sheets.
- ☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
- ☐ Prior to implementation, provide locations of water access.
- ☐ Prior to implementation, obtain grazing/wildlife habitat management plan specifying what species the enhancement is targeting and how grazing management is being modified to benefit that species. The written grazing plan must describe the management and harvest of vegetation with grazing and/or browsing animals, what conditions create the need to implement a contingency plan, and what monitoring method(s) will be used.
    - o The grazing plan will include a minimum of a 12-month rest period on 15% of enrolled acres incorporated into grazing strategy. Supporting documentation identifying baseline conditions will be based on state NRCS Conservation Practice Standard Prescribed Grazing (Code 528) specifications.
- ☐ During implementation, keep actual use records (dates, time, and number of head).
- ☐ During implementation, maintain water in the refuge area or nearby where the refuge provides needed cover for water access.
- ☐ During implementation, collect monitoring data used to determine contingency activation such as precipitation, drought, fire, and flooding or forage availability.
- ☐ During implementation, consult with NRCS to adjust and adapt the plan to current conditions to verify the changes meet enhancement criteria. Changes to the plan will be documented in writing.
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
    - o Grazing/wildlife habitat management plan.
    - o Monitoring data and actual use records.

CONSERVATION STEWARDSHIP PROGRAM

- Any documented changes to the plan as result of contingency or monitoring data.

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standards Prescribed Grazing (Code 528) and Upland Wildlife Habitat Management (Code 645) as they relate to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern: _____
WHEG score before implementation: _____
WHEG score after implementation: _____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ After implementation, review actual use and monitoring data used to implement grazing strategy and provide recommendations for adjustments, or additional practices to facilitate future improvements in wildlife habitat.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation: _____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528D

CONSERVATION STEWARDSHIP PROGRAM

Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range, Forest

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of rangeland plants, generally found on the Ecological Site Description or otherwise documented by measurement protocol, to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
  - Clear objectives
  - Resource inventory with ecological site description or reference sheet and structural improvements and existing resource conditions,
  - Grazing plan, and

CONSERVATION STEWARDSHIP PROGRAM

  - A contingency plan.

- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Identify species of concern in the objectives of the prescribed grazing plan.
- Plan intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the identified wildlife species.
- Evaluate wildlife habitat with the state NRCS Wildlife Habitat Evaluation Guide (WHEG) and manage for a WHEG value of 0.60 or greater.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, obtain a written grazing plan (NRCS can provide assistance as needed). Plan must include:

- Clear goals and objectives of the plan, including identification of the specie(s) of concern and the plant functional groups providing structure and composition.
- Contingency plan for events that trigger adverse results.
- Forage/Animal Balance.
- A grazing plan narrative describing the basis for when livestock movement or rotation will occur, including deferment plans.
- Contingency plans for forage shortfalls.
- Monitoring locations, key species, and monitoring techniques.
- Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

☐ During implementation, keep the following documentation:

- Livestock herd management records with seasonally important phenological stages of plant growth relative to species of concern.
- Annually complete a forage utilization worksheet, such as NRCS Conservation Practice Standard Prescribed Grazing (Code 528) job sheet.
- Grazing intensity records for all key grazing areas that accommodate the criteria.

☐ During implementation, consult with NRCS to adjust and adapt the grazing plan to current conditions to verify the changes meet enhancement criteria. Changes to the grazing plan will be documented in writing.

☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, complete an assessment of the site with NRCS using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern:_____
WHEG score before implementation:_____
WHEG score after implementation:_____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation:_____

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E528E

CONSERVATION STEWARDSHIP PROGRAM

Improved grazing management for enhanced plant structure and composition for wildlife

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Range; Forest; Associated Ag Land

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand.
- Removal of herbage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants, and the nutritional needs of the animals.
- Deferment (non-grazing period less than one year) and/or rest (non-grazing period equal or greater than one year) will be planned for critical periods of plant needs (such as post-planting or renovation, severe drought, etc.).
- Manage grazing and/or browsing animals to maintain adequate cover on sensitive areas (such as riparian areas, wetlands, habitats of concern, karst areas, etc.)

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- Manage livestock movements based on rate of plant growth, available forage, and allowable utilization target. Develop and follow contingency plans to deal with episodic disturbance events.
- Both the specie(s) of concern and the plant functional groups providing structure and composition will be identified in the objectives of the prescribed grazing plan.
- Plan the intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the desired fish and wildlife species of concern.
- Manage the afore-mentioned aspects of grazing events to maintain a minimum score of 0.60 when evaluated with the state NRCS Wildlife Habitat Evaluation Guide (WHEG).

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, obtain a written grazing plan (NRCS can provide assistance as needed). Plan must include:

- Clear goals and objectives of the plan, including identification of the specie(s) of concern and the plant functional groups providing structure and composition.
- Contingency plan for events that trigger adverse results.
- Forage/Animal Balance.
- A grazing plan narrative describing the basis for when livestock movement or rotation will occur, including deferment plans.
- Contingency plans for forage shortfalls.
- Monitoring locations, key species, and monitoring techniques.
- Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

☐ Prior to implementation, work with NRCS to complete an assessment of the site using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

☐ During implementation, keep the following documentation:

- Livestock herd management records with seasonally important phenological stages of plant growth relative to species of concern.
- Annually complete a forage utilization worksheet, such as NRCS Conservation Practice Standard Prescribed Grazing (Code 528) job sheet.
- Grazing intensity records for all key grazing areas that accommodate the criteria.

☐ During implementation, consult with NRCS to adjust and adapt the grazing plan to current conditions to verify the changes meet enhancement criteria. Changes to the grazing plan will be documented in writing.

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☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

☐ After implementation, complete an assessment of the site with NRCS using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).

NRCS will:

☐ As needed, provide technical additional assistance to the participant as requested.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement, including any state approved job sheets or work sheets.

☐ Prior to implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
Species of Concern: _____
WHEG score before implementation: _____
WHEG score after implementation: _____

☐ Prior to implementation, assist the participant with development of a grazing plan, if requested. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation to confirm the written objectives meet the criteria of the enhancement.

☐ Prior to implementation, explain the functionality of this enhancement with Enhancement E314A, if sequentially applicable.

☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.

☐ After implementation, review grazing plan, records, and documentation to verify the enhancement was implemented to meet the criteria.

☐ After implementation, complete an assessment of the site with the participant using the state's approved NRCS Wildlife Habitat Evaluation Guide (WHEG).
WHEG score after implementation: _____

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E528F

CONSERVATION STEWARDSHIP PROGRAM

Stockpiling cool season forage to improve structure and composition or plant productivity and health

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture; Associated Agricultural Land; Crop (Perennial); Crop (Annual and Mixed)

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

Criteria

Additions to the current Prescribed Grazing Plan must include:

- A record of designated paddocks and acreages to exclude grazing for a stated specified time period.
- The acreage needed for stockpiled forage will be predetermined.
- Stockpiled acreage will be supplied nutrients according to a land grant university approved soil test to achieve adequate forage growth at the beginning of the stockpiling period.
- Stockpile will be grazed in a manner that maintains specified minimum forage heights in the grazing plan to avoid damage to soil or forage.

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- Do not allow livestock to access previously grazed stockpiled areas when spring regrowth begins until recommended forage heights exist.
- The NRCS Conservation Practice Standard Prescribed Grazing (Code 528) must be followed on all pasture each year this enhancement is in effect. Note - leaving recommended residual forage heights, even though plants are dormant, are needed for erosion control and wildlife.
- Certification recorded that practice requirements have been met after grazing of stockpiled forages is complete before the new growing season begins.

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, develop a prescribed grazing plan including a plan map that delineates where forage stockpiling will occur. Make these materials available to NRCS for review.
- ☐ After implementation, make grazing records and photo documentation of stockpiling and level of use available to NRCS.

NRCS will:

- ☐ Prior to implementation, review grazing plan and maps provided by participant.
- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review records and photos provide to confirm adequate stockpiling and acceptable levels of grazing use.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528I

CONSERVATION STEWARDSHIP PROGRAM

Grazing management that protects sensitive areas-surface or ground water from nutrients

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

Criteria

- A written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife will be followed.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes: 1) Clear objectives, 2) A resource inventory including a forage inventory, structural improvements, and existing resource conditions, 3) Grazing plan, and 4) A contingency plan.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.
- Plan the intensity, frequency, timing and duration of grazing and/or browsing that will:
    - Minimize deposition or flow of animal wastes into water bodies or sinkholes,
    - Minimize animal impacts on stream bank or shoreline stability,
    - Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff, and
    - Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
- Livestock feeding and watering facilities will be located and designed/installed in a manner to improve livestock distribution and avoid overland flow to sensitive areas.
- When nutrients are applied on pastureland, soil testing and nutrient application will be done according to local land grant university guidance or the equivalent there of.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan that identifies the following:
  - The goals and objectives of the plan
  - Forage/Animal Balance
  - A grazing plan narrative describing the basis for when livestock movement or rotation will occur.
  - Contingency plans for forage shortfalls.
  - Monitoring locations, key species, and monitoring techniques.
  - A map identifying all permanent pastures, water sources, and any riparian area or other sensitive areas improved or maintained by this management.

- ☐ Prior to implementation, a nutrient management plan will be developed if nutrients will be applied. The nutrient management plan will detail appropriate soil testing protocol and acceptable nutrient application amounts.

- ☐ Prior to implementation, a copy of the competed grazing plan will be submitted to NRCS for review and approval.

- ☐ During implementation, consult with NRCS or a qualified grazing professional to adjust and adapt the grazing plan to current conditions. Changes to the grazing plan will be documented in writing.

- ☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ Prior to implementation, assist the participant with development of a grazing plan and/or nutrient management plan, as requested.

- ☐ Prior to implementation, review the plan(s) if not developed by NRCS.

- ☐ Prior to implementation, review soil test analysis

- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review written grazing records provided by the participant to determine if the grazing plan was adequately followed to protect or enhance riparian areas, wetland areas, or other sensitive areas.
- ☐ After implementation, review the nutrient management plan and application record to ensure nutrients were applied according to the plan.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528J

CONSERVATION STEWARDSHIP PROGRAM

Prescribed grazing on pastureland that improves riparian and watershed function

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Criteria

- Must follow a written plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes: 1) Clear objectives, 2) A resource inventory including a forage inventory, structural improvements, and existing resource conditions, 3) Grazing plan, and 4) A contingency plan.
- Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.
- Manage grazing and/or browsing to provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation by moving livestock appropriately.
- Graze and rest pastures appropriately and with the right numbers, class, and kind of livestock to maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.
- If nutrients are applied, soil testing and nutrient application will be done according to local land grant university guidance or equivalent.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan that identifies the following:
  - Goals and objectives of the plan
  - Forage/Animal Balance
  - A grazing plan narrative describing the basis for when livestock movement or rotation will occur.
  - Contingency plans for forage shortfalls.
  - Monitoring locations, key species, and monitoring techniques.
  - Map identifying all permanent pastures, water sources, and any riparian area or watershed drainage locations improved or maintained by this management.

- ☐ Prior to implementation, a nutrient management plan will be developed if nutrients will be applied. The nutrient management plan will detail appropriate soil testing protocol and acceptable nutrient application tolerances.

- ☐ Prior to implementation, a copy of the developed grazing plan will be submitted to NRCS for review and approval.

- ☐ During implementation, consult with NRCS or a qualified grazing professional to adjust and adapt the grazing plan to current conditions. Changes to the grazing plan will be documented in writing.

- ☐ After implementation, make all records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

- ☐ Prior to implementation, assist the participant with development of a grazing plan and nutrient management plan if requested to do so. If NRCS does not assist with plan development, the plan(s) will be reviewed by NRCS for approval prior to implementation.

- ☐ During implementation, as requested, assist the participant with adapting the grazing strategy and plan to current conditions.
- ☐ After implementation, review written grazing records provided by the participant to determine if the grazing plan was adequately followed to protect or enhance riparian areas, wetland areas, or overall watershed function.
- ☐ After implementation, if nutrients have been applied, soil testing and application records will be reviewed to determine if nutrients have been applied responsibly.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528L

CONSERVATION STEWARDSHIP PROGRAM

Prescribed grazing that improves or maintains riparian and watershed function-erosion

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range, Forest

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Criteria

- Must follow a written grazing plan for matching the forage quantity and quality produced with the grazing and/or browsing demand by livestock and wildlife.
- Enhance diversity of plants to optimize delivery of nutrients to the animals by incorporating the intensity, frequency, timing and duration of grazing and/or browsing needed as determined by a planning process that includes:
    - Clear objectives,
    - A resource inventory of structural improvements, existing resource conditions, and forage.
    - A monitoring plan
    - A contingency plan

- Supplemental feed or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.
- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.
- Manage grazing or browsing so as to provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff.
- Maintain adequate ground cover and plant density through monitoring to retain or improve filtering capacity of the vegetation by moving livestock appropriately.
- Adjust grazing strategy and rest as needed with the right numbers, class, and kind of livestock to maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, obtain a written grazing plan with:
  - o Inventory of structural improvements, existing resource conditions and forage
  - o Guidelines and recommendations for matching the forage quantity and quality produced with the grazing and/or browsing demand of livestock
  - o A contingency plan and
  - o A monitoring plan
- ☐ During implementation, keep pasture/herd in/out records and forage-animal balance sheet.
- ☐ During implementation, monitor riparian vegetation for use
- ☐ After implementation, make the follow items available for review by NRCS to verify implementation of the enhancement:
  - o Written grazing plan
  - o Pasture/herd in/out records
  - o Documented utilization records
  - o Monitoring plan

NRCS will:

- ☐ As needed, provide technical additional assistance to the participant as requested.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) as it relates to implementing this enhancement.

- ☐ After implementation, verify implementation of the written grazing plan, by reviewing plan and pasture/herd in/out records and forage-animal balance sheets kept during enhancement implementation.
- ☐ After implementation, review the monitoring plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____

Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E528R

CONSERVATION STEWARDSHIP PROGRAM

Management Intensive Rotational Grazing

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN ADDRESSED: PLANTS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Criteria

- Management-intensive rotational grazing increases harvest efficiency of vegetation with grazing and/or browsing animals through smaller paddock sizes, higher stock density while maintaining plant residue with enough energy reserves to recover quickly when adequate soil moisture is available for regrowth.
- Must develop and implement a written grazing plan that:
  - increases stock density
  - shortens grazing periods
  - enhances plant recovery
  - matches the forage quantity and quality produced with the grazing and / or browsing animal, and

  - increases harvest efficiency and manure distribution by significantly increasing the existing stock density per herd.

- Removal of forage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants and the nutritional needs of the livestock.

- Deferment (non-grazing period less than one year) and / or rest (non-grazing period equal to or greater than one year) will be planned for critical periods of plant needs.

- Manage livestock rotation based on rate of plant growth, available forage, and allowable utilization target.

- Manage livestock rotation to provide adequate ground cover and plant density to decrease soil erosion, reduce runoff and improve infiltration and water holding capacity.

- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.

- Utilize higher stock density and shorter grazing periods in riparian areas to minimize impact to stream bank or shoreline stability and ensure other sensitive areas such as wetlands, habitats of concern, karst areas do not become degraded.

- Implement and maintain a rotational grazing system using a combination of permanent or temporary division fences and water facilities to serve the management needs of operation.

- Develop and follow contingency plans to deal with drought or flooding or other episodic disturbance events.

Develop and implement a monitoring plan that at a minimum evaluates livestock performance, plant community composition and density, and soil function components such as ground cover, infiltration and aggregate stability.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementing, obtain a grazing plan map delineating the existing paddock system, along with a livestock inventory (type, class, average weight, and number) to document the current stocking density and current stocking rate.
- ☐ Prior to implementation, acquire a prescribed grazing plan, with a plan narrative delineating the following:
    - The goals and objectives of the plan
    - Map showing the number of paddock subdivisions with water sources, proposed stock densities per paddock associated with different herds in the system.
    - Forage Inventory
    - Forage / Animal Balance
    - A grazing plan narrative describing the basis for when livestock movement or rotation will occur
    - A contingency plan
    - A monitoring plan
- ☐ During implementation, keep pasture/ herd in/out records, stock density records and photos of paddock condition and photos of high stock density grazing implementation.
- ☐ After implementation, provide the following items for review by NRCS:
    - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
    - Paddock / herd in / out records with actual stock densities documentation.
    - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
    - Changes made to the grazing management plan.

NRCS will:

- ☐ As needed, provide technical assistance to participant as requested.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) and supporting documents that are needed to implement this enhancement, such as forage-animal balance forms.
- ☐ Prior to implementation, review the existing grazing plan, maps and livestock inventory provided by the participant.
- ☐ Review the newly proposed grazing plan fencing and watering layout, associated maps and stock density numbers for each herd.
- ☐ After implementation, review the following:
  - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
  - Paddock / herd in / out records with actual stock densities documentation.
  - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
  - Changes made to the grazing management plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533A

CONSERVATION STEWARDSHIP PROGRAM

Advanced Pumping Plant Automation

Conservation Practice 533: Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Water

PRACTICE LIFE SPAN: 1 year

Enhancement Description

This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation. These decisions should be made in conjunction with an irrigation water management plan. Field measuring devices may be part of the IWM plan, but additional devices can be installed as part of the enhancement such as water level, fuel level, pressure, or speed control sensors.

Criteria

- Documentation that ensures the control devices is compatible with the exiting pump station and irrigation system
- Detailed drawings of how the control device will connect to the existing pump station
- Protective structure/mechanism
- Irrigation water management (IWM) plan that follows the NRCS Conservation Practice Standard Irrigation Water Management (CPS449)
- Components necessary for automation depends on the type of pump installed, but both electric and combustible system should have a flow meter as indicated below:
    - Electrical power unit- flow meter with data logger and telemetry, necessary circuit boards and protections, VFD (if applicable), antenna, modem, housing, and other appurtenances as applicable

- Diesel power units- flow meter with data logger and telemetry, necessary circuit boards and protections, antenna, modem, housing, fuel use meter, and other appurtenances as applicable.

Documentation and Implementation Requirements

Participant will:

Prior to implementation

- ☐ Completed IWM plan, documenting guidance and landowner decision using State specific protocol
- ☐ Map delineating the location of the installed pumping plants, soil moisture sensors, electronic water level sensors, pipeline networks, permanent flow meters and fields they serve. All components should be capable of telemetry
- ☐ Digital/Printed photography of installed components and GPS location

During implementation

- ☐ Provide documentation ensuring that the control device and supporting appurtenances allow the pumping station to continue to operate safely and in the range of designed operating conditions
- ☐ Provide documentation of the protective structure(s) meet the requirement of the control device and supporting appurtenances. Ensure that the protective structures meet NRCS standards
- ☐ Record each irrigation event, and daily soil moisture/water level (if applicable) throughout growing season.
- ☐ Apply irrigation water based on irrigation scheduling method selected to meet the crop's needs and maximize irrigation water efficiency.
- ☐ Measure and record the amount of water used to irrigate as it comes onto the farm and is applied to each field.

After implementation

- ☐ Copy of the record each irrigation event, and daily soil moisture/water level (if applicable), and rainfall throughout growing season.

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement
- ☐ Provide and explain NRCS Conservation Practice Standard Irrigation Water Management (Code449) as it relates to implementing this enhancement
- ☐ Provided additional assistance to the participant as requested

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Review and approve producer's selected equipment

After Implementation

- ☐ Verify installation of the control device and all supporting appurtenances
- ☐ Verify that the control device is compatible with the pumping station and the range of operation condition
- ☐ Verify implementation of irrigation water management plan by reviewing records kept during enhancement implementation

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533B

CONSERVATION STEWARDSHIP PROGRAM

Complete pumping plant evaluation for energy savings

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Evaluation of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to reduce energy use. Evaluate to determine if a Variable Frequency Drive motor controller(s) will reduce energy use and is feasible.

Criteria

- Pump test evaluation will include all irrigation pumps on the on fields where the activity is implemented. There could be multiple pumps that are used on single or multiple fields.

- Minimum data necessary to complete the pumping evaluation:
  - Flow rate, instantaneous and for the season.
  - Pressure at different flow rates based on partial or complete irrigations.
  - Power usage to compute efficiency of the drive unit.
  - Area and fields irrigated.
  - Estimate of friction loss in pipelines based on pressure drop in lines during test.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation:

- ☐ Provide NRCS with a map showing the location of all fields and pumps connected to the irrigation system.
- ☐ Arrange for pump test evaluations of all irrigation pumps on fields where activity is implemented.

During implementation

- ☐ Have a pump test evaluation performed on all irrigation pumps that service the fields where activity is implemented.

After implementation

- ☐ Make the following items available for review by NRCS to verify implementation of the enhancement:
  - Pump test evaluation report(s).
  - Provide a list of any adjustments to improve system efficiency made as a result of the evaluation. Calculate the reduction of energy use based on before and after conditions. Energy savings can be reported as the average annual or seasonal energy reduction compared to previous operating conditions.

NRCS will:

Prior to implementation

- ☐ Provide and explain Pumping Plant (Code 533) to participant as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.

After implementation

- ☐ Verify pump test evaluation, by reviewing evaluation report.
- ☐ Verify energy savings based on system efficiency before and after implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E533C

CONSERVATION STEWARDSHIP PROGRAM

Install VFDs on pumping plants

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Energy

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in the evaluation.

Criteria

- Implement recommendations for components from a pumping plant evaluation where the FVD is feasible, reduces energy use, and the existing or new electric drive unit will support the VFD.
- The replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.
- Components of this enhancement will meet the NRCS Conservation Practice Standard Pumping Plant (Code 533).

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

Prior to implementation:

- ☐ Review pumping plant evaluation, season of use, existing pump motor needs, and current operation.
- ☐ Evaluate site specific energy alternatives and net benefit of the Variable Frequency Drive(s).
- ☐ Ensure that energy utility provider has reviewed and approved location of installation on pump motor, including needs for electrical harmonic filter.
- ☐ Obtain written documentation of utility approval for site with requirements for installation.

During implementation

- ☐ Ensure installation meets federal National Electrical Code and any local or state codes.

After implementation

- ☐ Provide documentation of installation including first season energy use for comparison to prior years to NRCS for review to verify implementation of the enhancement.
- ☐ Monitor and maintain system for the life span of the practice (10 years).

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ Review with the participant the costs and benefits of the installation of Variable Frequency Drive(s).
- ☐ Develop written specifications describing site specific details of installation, including:
    - The replacement or retrofit system and/or related components or devices.
    - Baseline system energy usage and potential energy savings from the implementation of this enhancement.
    - Plan view showing the location of the measures in relation to other structures or natural features, where appropriate.
    - Electrical wiring that meets the requirements of the National Electrical Code.
    - Operation and maintenance plan that is consistent with the purpose(s) of this practice, its intended life, and safety requirements.

CONSERVATION STEWARDSHIP PROGRAM

After implementation

- ☐ Verify energy savings based on system efficiency before and after implementation of the enhancement

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

CONSERVATION ENHANCEMENT ACTIVITY

E533D

CONSERVATION STEWARDSHIP PROGRAM

Switch fuel source for pumps

CONSERVATION PRACTICE: 533 - Pumping Plant

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Associated Ag Land; Farmstead

RESOURCE CONCERN: Air

ENHANCEMENT LIFE SPAN: 15 years

Enhancement Description

Switch the fuel source for the pump motor(s) to an on-farm renewable source (wind, solar, geothermal, etc.).

Criteria

- Replace an existing pump motor with a drive unit that is powered by a renewable source such as wind, solar, geothermal, etc. that can adequately maintain the existing operating conditions, flow rates and pressures.
- The replacement or retrofit system and related components or devices meet or exceed currently applicable federal, state, and local standards and guidelines.
- Components of this enhancement will meet the NRCS Conservation Practice Standard Pumping Plant (Code 533).

Documentation and Implementation Requirements

Participant will:

Prior to implementation:

- ☐ Evaluate current operating conditions of the existing pump(s) including season of use and motor needs.
- ☐ Evaluate site specific renewable energy alternatives.
- ☐ Evaluate options during lack of production of renewable energy source.

During implementation

- ☐ Ensure installation meets federal National Electrical Code and any local or state codes.

After implementation

- ☐ Monitor and maintain system for the life span of the practice (10 years).

NRCS will:

Prior to implementation

- ☐ Provide and explain NRCS Conservation Practice Standard Pumping Plant (Code 533) as it relates to implementing this enhancement.
- ☐ As needed, provide additional technical assistance to the participant as requested.
- ☐ Review with the participant the costs and benefits of conversion to renewable energy source.
- ☐ Develop written specifications describing site specific details of installation, including:
  - ☐ The replacement or retrofit system and/or related components or devices.
  - ☐ Plan view showing the location of the measures in relation to other structures or natural features, where appropriate.
  - ☐ Method used to protect existing power provider from back feed from renewable source.
  - ☐ Electrical components that meet the requirements of the National Electrical Code.
  - ☐ Operation and maintenance plan that is consistent with the purpose(s) of this practice, its intended life, and safety requirements.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E580A

CONSERVATION STEWARDSHIP PROGRAM

Stream corridor bank stability improvement

Conservation Practice 580: Streambank and shoreline protection

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Range; Forest; Farmstead; Associated Ag Land

RESOURCE CONCERN: Soil

ENHANCEMENT LIFE SPAN: 20 years

Enhancement Description:

Stream corridor bank vegetation components are established to provide additional stream corridor bank stability.

Criteria:

- This enhancement can be applied to streambanks and adjacent floodplain/riparian area of natural channels where the channel is susceptible to erosion and migration.
- Stream corridor vegetative components must be established as necessary for ecosystem functioning and stability. The appropriate composition of vegetative components is a key element in preventing excess long-term channel migration in re-established stream corridors.
- Dominant vegetation will consist of existing, naturally-regenerated, or seeded/planted trees and shrubs suited to the soil and hydrology of the site. Vegetation established on channel banks and adjoining areas must be in accordance with NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- Vegetation cover that promotes sediment deposition should be used to help floodplain development and growth. Overland flow should be maintained as sheet flow through the adjacent floodplain/riparian area to prevent erosion and promote sediment deposition.

- Utilize vegetative species that are native and/or compatible with local ecosystems. Avoid introduced, invasive, noxious or exotic species that could become nuisances. Where possible, select plant materials that also provide habitat requirements for desirable wildlife and pollinators.
- Treatments should meet aesthetic and recreational objectives as determined by a site-specific assessment or management plan. Aesthetic objectives should be based on human needs, including visual quality, noise control, and microclimate control. Treatments should be designed to achieve recreation objectives as determined by a site-specific assessment or management plan. Safety requirements shall be based on type of human use and recreation objectives.
- Construction materials, grading practices, and other site development elements must be selected and designed to be compatible with adjacent land uses.
- Livestock exclusion must be considered during establishment of vegetative treatments and appropriate grazing practices applied after establishment to maintain plant community integrity. Wildlife may also need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.
- Design the stream corridor and bank vegetation enhancement for an expected life of at least 20 years. Protective treatments must be self-sustaining or require minimum maintenance.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation, prepare the planned acres for tree or shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342). (NRCS will provide technical assistance, as needed.)

☐ Prior to implementation, select a combination of deep-rooted trees and shrubs appropriate for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration. If possible, select plant materials that also provide habitat for desirable wildlife and pollinators (NRCS will provide technical assistance, as needed.)

Species / Type	Number	Wildlife habitat characteristic(s), if any

☐ Prior to implementation, select arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

TASKS	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____
Planting Date					
Planting Technique					
Arrangement/Spacing					

☐ During implementation, use erosion control methods based upon specifications developed for the site.

☐ After implementation, protect the area from livestock until vegetation is well-established, and, if necessary, control wildlife access within state and local regulations.

☐ After implementation, conduct inspections after high flows and undertake prompt actions if there is excessive streambank or streambed instability or erosion.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately graded and prepared for tree and shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342).
- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.
- ☐ As needed, prior to implementation, NRCS will provide technical assistance for:
  - Selecting a combination of appropriate, deep-rooted tree and shrub species for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration.
  - Selecting appropriate arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions.
  - Planning the use of additional erosion control, as needed for the site.
  - Preparing specifications for applying this enhancement using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify the planned trees and shrub species were established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from livestock and, as necessary, from wildlife.
- ☐ After implementation, verify planned erosion control provided by the site is functioning and is maintained to specifications developed for the site.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E580B

CONSERVATION STEWARDSHIP PROGRAM

Stream corridor bank vegetation improvement

Conservation Practice 580: Streambank and shoreline protection

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture; Range; Forest; Farmstead; Associated Ag Land

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 20 years

Enhancement Description

Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

Criteria

- This enhancement can be applied to streambanks and adjacent floodplain/riparian area of natural channels where the channel is susceptible to erosion.
- Stream corridor vegetative components shall be established as necessary for ecosystem functioning and stability. The appropriate composition of vegetative components is a key element in preventing excess long-term channel migration in re-established stream corridors.
- Establishment of vegetation on channel banks and associated areas shall also be in accordance with NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- Utilize vegetative species that are native and/or compatible with local ecosystems. Avoid introduced, invasive, noxious or exotic species that could become nuisances.
- Select plant materials that provide habitat requirements for desirable wildlife and pollinators.

- Treatments shall be designed to achieve habitat and population objectives for fish and wildlife species or communities of concern as determined by a site-specific assessment or management plan. Objectives shall be based on the survival and reproductive needs of populations and communities, which include habitat diversity, habitat linkages, daily and seasonal habitat ranges, limiting factors and native plant communities.
- The type, amount, and distribution of vegetation shall be based on the requirements of the fish and wildlife species or communities of concern to the extent possible.
- Treatments shall be designed to meet aesthetic objectives as determined by a site-specific assessment or management plan. Aesthetic objectives shall be based on human needs, including visual quality, noise control, and microclimate control.
- Construction materials, grading practices, and other site development elements shall be selected and designed to be compatible with adjacent land uses.
- Treatments shall be designed to achieve recreation objectives as determined by a site-specific assessment or management plan. Safety requirements shall be based on type of human use and recreation objectives.
- Livestock exclusion shall be considered during establishment of vegetative treatments and appropriate grazing practices applied after establishment to maintain plant community integrity. Wildlife may also need to be controlled during establishment of vegetative treatments. Temporary and local population control methods should be used with caution and within state and local regulations.
- Design the stream corridor and bank vegetation enhancement for an expected life of at least 20 years.

Documentation and Implementation Requirements

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, prepare the planned acres for tree or shrub establishment. Refer to NRCS Conservation Practice Standards Streambank and Shoreline Protection (Code 580) and Critical Area Planting (Code 342). (NRCS will provide technical assistance, as needed.)
- ☐ Prior to implementation, select a combination of deep-rooted trees and shrubs appropriate for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration. These plant materials should also provide habitat for wildlife, pollinators, and fish species as determined by a site-specific assessment or management plan (NRCS will provide technical assistance, as needed.)

Plant Species / Type	Number	Planted for what wildlife, pollinators, fish:

- ☐ Prior to implementation, select arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions. (NRCS will provide technical assistance, as needed.)

TASKS	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____	Species/Type _____
Planting Date					
Planting Technique					
Arrangement/Spacing					

- ☐ During implementation, use erosion control methods based upon specifications developed for the site.
- ☐ After implementation, protect the area from livestock until vegetation is well-established, and, if necessary, control wildlife access within state and local regulations.
- ☐ After implementation, conduct inspections after high flows and undertake prompt actions if there is excessive streambank or streambed instability or erosion.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, verify the enhancement is planned for acres that have been appropriately graded and prepared for tree and shrub establishment. Refer to NRCS Conservation Practice Standard Critical Area Planting (Code 342).
- ☐ Prior to implementation, verify no plants on the Federal or state noxious weeds list are included.
- ☐ As needed, prior to implementation, NRCS will provide technical assistance:
  - ○ Developing a Wildlife Habitat Management Plan for targeted suite of species.
  - ○ Meeting with participant to review the Wildlife Habitat Management Plan and plan and specifications.
  - ○ Selecting a combination of appropriate, deep-rooted tree and shrub species for preventing bank erosion, promoting sedimentation, and limiting long-term channel migration and achieving habitat and species objectives.
  - ○ Selecting appropriate arrangement and spacing design to maximize erosion control and planting techniques and timing appropriate for the site and soil conditions.
  - ○ Planning the use of additional erosion control, as needed for the site.
  - ○ Preparing specifications for applying this enhancement using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- ☐ During implementation, verify all erosion control needed for the site is functioning and is maintained to specifications developed for the site.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify the planned trees and shrub species were established to specifications developed for the site.
- ☐ After implementation, verify the planting is protected from livestock and, as necessary, from wildlife.
- ☐ After implementation, verify planned erosion control provided by the site is functioning and is maintained to specifications developed for the site.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E590C

CONSERVATION STEWARDSHIP PROGRAM

Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Conservation Practice 590: Nutrient Management

APPLICABLE LAND USE: Pasture

RESOURCE CONCERN: Water

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

Criteria

- Documentation of producer's record of nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- For nitrogen (N), phosphorus (P), and potassium (K), plan application rates using land grant university (LGU) recommendations or industry practices when recognized by the LGU. Lower-than-recommended nutrient application rates are permissible if the client's objectives are met.
- Geo-referenced map of all current and planned hay feeding areas, watering facilities, shelters, or other potential areas of animal concentration.

CONSERVATION STEWARDSHIP PROGRAM

- Minimize soil surface disturbance during fertilizer placement.
- **Utilize two or more nutrient use efficiency strategies or technologies** to reduce nutrient loss risk and improve nutrient use efficiency. Select two or more of the strategies and technologies below:
    - Split nutrient applications.
        - Apply no more than 50% of total forage N needs before green up of dormant grasses. Apply the remaining N after green up.
        - Additional nitrogen applications may be reduced or eliminated based on forage scouting, in-season soil sampling/analysis, or plant tissue sampling/analysis.
    - Nutrient application placement below soil surface.
        - Nutrients are injected or incorporated using a minimal soil disturbance method at time of application.
    - Use variable rate technology for all nutrient applications. Variable rate technology may be map-based, sensor-based (crop canopy sensors), or manual. Requires the development of site-specific production maps using soils data, current soil test results, or a productivity monitoring system with GPS to correlate field location with productivity. Data is used to diagnose low, medium, and high productivity areas (pasture management zones).
    - Movement of hay feeding locations to distribute nutrients across the pasture(s) to avoid areas of nutrient concentration and sensitive areas. Develop a detailed hay feed movement plan, which includes soil sampling of the historic/current hay feeding areas and planned areas to assess status of soil nutrients. Monitoring required through annual soil sampling, geo-references photographs, and written records.
    - Adjust pH to the optimum level for legumes and forages. Apply soil amendments to adjust soil pH according to soil test recommendations. Monitoring required through

annual soil sampling. *This option is only applicable on fields with documented need and having existing stands of forage species that do not need re-establishment.*

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide documentation for review by NRCS showing a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- ☐ Prior to implementation, develop and document a planned nutrient budget, forage production goal, and applications (pounds/acre active ingredient, nutrients must include at a minimum N-P-K). *If variable rate technology will be used develop site-specific yield maps and use them to develop management zones within the pasture.*
- ☐ Prior to implementation, develop geo-referenced maps showing location of current areas of livestock concentration.
- ☐ Prior to implementation, select two or more of the nutrient use efficiency strategies or technologies. **Selections:** _____
- ☐ During implementation, keep records to document actual nutrient applications (pounds/acre active ingredient, nutrients must include at a minimum N-P-K).
- ☐ During implementation, minimize soil surface disturbance during fertilizer placement.
- ☐ During implementation, notify NRCS of any planned changes to verify the planned system meets the enhancement criteria.
- ☐ During implementation, additional record keeping requirements for specific strategy or technology:
    - Nutrient application placement below soil surface. Records and documentation must include method of injection or incorporation and depth.

- Variable rate technology. Keep records to document as applied records of actual variable rate applications (maps and/or tabular statistics).
- Monitoring of hay feeding location movement. Maintain annual soil sample results, geo-references photographs, and written records.
- Adjust pH. Maintain soil test results.

☐ After implementation, make documentation and records available for review by NRCS to verify implementation of the enhancement.

NRCS will:

☐ As needed, provide technical assistance to meet the criteria of the enhancement.

☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Nutrient Management (CPS 590) as it relates to implementing this enhancement.

☐ Prior to implementation, review documentation to verify a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.

☐ Prior to implementation, verify the development of a planned nutrient budget, yield goal, and planned nutrient applications. *If variable rate technology will be used, verify the development of site-specific yield maps used to develop management zones within the field.*

☐ Prior to implementation, verify the selection of two or more nutrient use efficiency strategies or technologies.

☐ During implementation, evaluate any planned changes to verify the planned system meets the enhancement criteria.

☐ After implementation, review documentation and records to verify implementation of the enhancement.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E595A

CONSERVATION STEWARDSHIP PROGRAM

Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Conservation Practice 595: Integrated Pest Management

APPLICABLE LAND USE: Crop (annual & mixed); Crop (perennial)

RESOURCE CONCERN ADDRESSED: Water Quality Degradation

ENHANCEMENT LIFE SPAN: 1 year

Enhancement Description

Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

Criteria

- Documentation of producer's record of integrated pest management meeting all Conservation Practice Standard Integrated Pest Management (CPS 595) general criteria
- Use of GPS or other geospatial technologies is required to document application and site-specific compliance with all label requirements for controlling non-target application.
- Utilize one or more of the following techniques to reduce the total amount of chemical applied and reduce the potential for delivery of chemicals into water bodies:
    - Precision guidance system which reduces ground or aerial spray overlap to less than 12 inches

- Variable rate technology (VRT) which allows rate of pesticide application to dynamically change for site specific applications
- "Smart sprayer" technology which utilizes automatic sensors and computer controlled nozzles to turn individual nozzles on and off

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, provide documentation of implementation of integrated pest management meeting all Conservation Practice Standard Integrated Pest Management (CPS 595) general criteria and additional criteria to prevent or mitigate off-site pesticide risks to water quality from leaching, solution runoff, and adsorbed runoff losses.
- ☐ During implementation, keep records of applications using the selected technology with maps and/or tabular data.
- ☐ After implementation, make the following items available for review by NRCS to verify implementation of the enhancement:
  - As applied records of actual applications using the selected technology (maps and/or tabular statistics).

NRCS will:

- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Integrated Pest Management (CPS 595) as it relates to implementing this enhancement.
- ☐ As needed, provide technical additional assistance to the participant as requested.
- ☐ After implementation, verify implementation of the enhancement, by reviewing records created during enhancement implementation.

NRCS Documentation Review:

CONSERVATION STEWARDSHIP PROGRAM

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Acres Applied _____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

Conservation Enhancement Activity

E644A

CONSERVATION STEWARDSHIP PROGRAM

Managing Flood-Irrigated Landscapes for Wildlife

Conservation Practice 644: Wetland Wildlife Habitat Management

APPLICABLE LAND USE: Crop (Annual & Mixed), Crop (Perennial), Pasture

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

Criteria

- Develop a conservation plan for the targeted species suite.
- As identified in the conservation plan, flood-irrigation will be applied in an amount and at a time to meet the targeted wildlife need.
- States will apply general criteria from the NRCS National Conservation Practice Standard Wetland Wildlife Habitat Management (Code 644) and additional criteria as required by the NRCS State Office
- Targeted species must be listed on the State Wildlife Action Plan or as State Endangered, State Threatened, State Sensitive (or similar designation).
- Appropriate locations for this enhancement will be provided by the NRCS State Office (NRCS State Office will base locations on current distribution of the targeted species and potential expansion into adjacent habitat for the target species. Other agencies

(e.g. State Department of Fish and Game, USFWS) and organizations (e.g. Ducks Unlimited, The Nature Conservancy) will provide input to NRCS concerning instances where the enhancement is used to provide habitat outside of the current distribution of the target species.)

- Use of fertilizers, pesticides, and other chemicals shall not compromise the intended purpose of this practice.
- Use criteria in other NRCS Conservation Practice Standards to facilitate the management of wetland wildlife habitat as appropriate for the site.
- Depending on site conditions, facilitative practices may be used to implement this enhancement. The NRCS Conservation Practice Standards may include, but are not limited to: Dam, Diversion (Code 348), Diversion (Code 362), Fence (Code 382), Field Border (Code 386), Filter Strip (code 393), Grade Stabilization Structure (Code 410), Irrigation Canal or Lateral (Code 320), Irrigation Field Ditch (Code 388), Irrigation Pipeline (Code 430), Irrigation Storage Reservoir (Code 436), Irrigation System, Surface and Subsurface (Code 443), Irrigation Water Management (Code 449), Nutrient Management (Code 590), Pumping Plant (Code 533), Riparian Herbaceous Cover (Code 390), Shallow Water Development and Management (Code 646), Stream Crossing (code 578), Structure for Water Control (Code 587), and Wetland Enhancement (Code 659).
- A Wildlife Habitat Evaluation Guide (WHEG) specific to wildlife habitat within a flood-irrigated landscape on perennial cropland or pasture must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than or equal to 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Digital photographs documenting the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, provide and explain state NRCS Conservation Practice Standard Wetland Wildlife Habitat Management (Code 644) as it relates to implementing this enhancement.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement; **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant, and discuss range of management alternatives that would improve wildlife habitat conditions
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, review and explain the Wildlife Habitat Management Plan to the participant.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**

☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646A

CONSERVATION STEWARDSHIP PROGRAM

Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

ENHANCEMENT LIFE SPAN: 5 years

Enhancement Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

Criteria:

This enhancement applies to crop land use acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures that affect applicable fields will be closed by mid-fall and remain closed through February 15. For fields where harvest of the crop occurs after mid-fall (e.g., ratoon rice), structures must be closed within 2 days following harvest and remain closed through February 15.
- Applicable fields must be flooded to an average depth of 6 to 18 inches.
  - Water depths of 6 to 10 inches provide maximum benefit to targeted species.
  - Water depths shall not exceed 18 inches for any extended period.

- Manipulation can occur prior to holding water. Manipulation should not affect more than 80 percent of the field to which the activity is applied.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be paired with E647A - Manipulate vegetation on fields with captured rainfall for waterfowl and wading bird winter habitat. If not paired with E647A, this Enhancement may also be paired with E646C – Manipulate vegetation and maintain closed structures for shorebird mid-summer habitat or E646D – Manipulate vegetation and maintain closed structures for shorebird late summer habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure all water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review the results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified, to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened
  - o Digital photographs documenting the condition of the structures and the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify the enhancement will be applied to cropland acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement. **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with the participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using the Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review completed field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646B

CONSERVATION STEWARDSHIP PROGRAM

Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. In addition, flooded conditions promote establishment of aquatic invertebrate populations, a protein-rich food source for shorebirds as well as waterfowl and wading birds. Flooded conditions across the broader landscape promote a network or continuity of habitat that is available to migratory waterfowl and wading birds. Benefits may become greatest during late winter and early spring as birds are assimilating nutrient and fat reserves in preparation for northward migration. However, agricultural fields flooded during fall-winter are typically drained during late January or February in advance of spring planting. This often results in a rapid reduction in available habitat and may constrain ability of migratory birds to adequately prepare for migration, with greatest impacts likely occurring during years of low winter precipitation. Retention of water on agricultural lands into early spring will produce maximum benefits to migratory waterfowl and shorebirds by providing high quality habitat during a time when habitat may otherwise be in low abundance.

Criteria:

This enhancement applies to crop land use acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures affecting the subject land use are to be closed by mid-fall and remain closed until late winter to early spring.
    - Water depths of 6 to 10 inches provide maximum benefit to targeted species.
    - Water depths shall not exceed 18 inches for any extended period.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be grouped with E647A - Manipulate vegetation on fields with captured rainfall for waterfowl and wading bird winter habitat. If not grouped with E647A, this Enhancement may also be grouped with E646C – Manipulate vegetation and maintain closed structures for shorebird mid-summer habitat or E646D – Manipulate vegetation and maintain closed structures for shorebird late summer habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified in order to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain a field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened
  - o Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess the habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement; **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review the results of the wildlife habitat evaluation with the participant, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646C

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Criteria:

This enhancement applies to crop land use acres with leveed fields that are capable of holding 8 to 18 inches of water in early spring, can retain that water until July 31 and will have less than 25 percent woody cover.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures affecting the subject land use acre are to remain closed catching and holding all available precipitation, until mid-summer (i.e. July 31).

- Sites must contain 8 to 18 inches of water.
- Manipulate vegetation on the site, if after late spring to early summer, the site becomes dry with emergent vegetation covering 50 percent or more, at a height of 6 inches or more. Manipulate by rolling or disking to bring the majority (75 percent or more) of the vegetation at or below the soil surface. Rolling is the preferred method of manipulation to maintain soil quality.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

  Note: This Enhancement may be grouped with E646B – Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified in order to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain a field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time the water control structure was closed;
  - o Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - o Date/time when the water control structures were opened;
  - o Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding 8 to 18 inches of water in early spring, can retain that water until July 31 and will have less than 25 percent woody cover.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of

CONSERVATION STEWARDSHIP PROGRAM

Enhancement; **Existing WHEG score = _____**
Planned Post Implementation WHEG score = _____

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant, and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using the Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____
NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E646D

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation and maintain closed structures for shorebird late summer habitat

Conservation Practice 646: Shallow Water Development and Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

PRACTICE LIFE SPAN: 5 years

Enhancement Description:

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Criteria:

This enhancement applies to crop land use acres with leveed fields that are capable of holding 8 to 18 inches of water mid-spring with capabilities for retaining that water until August 31, and will have less than 25 percent woody cover.

- Develop a wildlife habitat management plan for the targeted species suite.
- Water control structures are to remain closed in order to catch and hold all available precipitation until late-summer (i.e., August 31).

- Sites must contain 8 to 18 inches of water.
- Manipulate vegetation on the site, if after June 15, the site becomes dry with emergent vegetation covering 50 percent or more, at a height of 6 inches or more. Manipulation by rolling or disking to bring the majority (75 percent or more) of the vegetation at or below the soil surface. Rolling is the preferred method of manipulation to maintain soil quality.
- The need for vegetative manipulation will be triggered by the above stated scenario. However, multiple manipulations may be needed to achieve the desired habitat response.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be grouped with E646B - Extend retention of captured rainfall for waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, ensure water control structures are in proper working order.
- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan including opening / closing water control structures as specified to hold water at the proper time and at the proper depth.
- ☐ During implementation, maintain the field log to include:
  - Crops grown and the harvest date for the crops grown on the applicable acres;
  - Date/time the water control structure was closed;
  - Date/time of each field visit and observed water levels or percent holding capacity and average water depths;
  - Date/time when the water control structures were opened;
  - Digital photographs documenting the condition of the structures and the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to cropland acres with leveed fields capable of holding 8 to 18 inches of water mid-spring with capabilities for retaining that water until August 31, and will have less than 25 percent woody cover.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement; **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop the Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.
- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number_____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647A

CONSERVATION STEWARDSHIP PROGRAM

Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERNS: Animals

ENHANCEMENT LIFE SPAN: 5 years

Enhancement Description:

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units, especially in the Gulf Coast and Central Valley of California. When flooded to shallow depths during fall and winter, these agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

Criteria:

CONSERVATION STEWARDSHIP PROGRAM

This enhancement applies to crop land use acres with leveed fields that contain robust vegetation (e.g., post-harvest rice stubble, annual grasses and sedges) and are capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.

- Develop a wildlife habitat management plan for the suite of species targeted.
- Manipulation vegetation by either lightly disking or bush hogging or rolling the majority (50-80 percent) of the contracted acres during early to late fall.
    - For fields where harvest of the crop occurs later (e.g., ratoon rice), manipulation must be conducted within 7 days following harvest.
    - Manipulation shall not be done in a large, continuous block. Strip disking and/or mowing in mosaic or other irregular patterns is required.
    - Manipulation can occur prior to or during the water holding period, but manipulation must not affect greater than 80 percent of the field.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

Note: This Enhancement may be paired with E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat or E646B – Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain a field log to include:
  - Crops grown and the harvest date for the crops grown on the applicable acres;
  - Date/time and description of all habitat management actions taken;
  - Digital photographs documenting the condition of the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop acres with leveed fields that contain robust vegetation (e.g., post-harvest rice stubble, annual grasses and sedges) and are capable of holding water at an average depth of 6 to 18 inches for the duration of the activity.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with participant to review the Wildlife Habitat Management Plan.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review the field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647C

CONSERVATION STEWARDSHIP PROGRAM

Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN ADDRESSED: Animal

ENHANCEMENT LIFE SPAN: 5 year

Enhancement Description:

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

Criteria:

This enhancement applies to cropland acres on soils that are hydric and/or significantly water saturated during the growing season and are located on the low side or down slope portion of a field that receives hydrologic surface flow from the remainder of the field. Surface flow could be a result of irrigation or rainfall. Selected areas should be capable of being flooded using a water control structure or other means.

- Develop a habitat management plan targeting waterfowl, shore birds and wading birds for the area enrolled under this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- Maintain naturally occurring vegetation on the appropriate, selected area (minimum 20 feet wide and 500 feet long) to provide forage and cover for waterfowl, shorebirds and wading birds.
- Manipulation (light disking, burning, mowing, or rolling) of the selected area will be allowed during early fall to increase attractiveness and use by targeted species. Otherwise, all mechanical disturbance and chemical treatments shall be excluded from the selected area and care should be taken to ensure that the area is not impacted by agricultural operations in the adjacent crop.
- Control of invasive species may be allowed with approval from local NRCS staff.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review Wildlife Habitat Management Plan.
- ☐ During implementation, follow Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Crops grown and the harvest date for the crops grown on the applicable acres;
  - o Date/time and description of all habitat management actions taken;
  - o Digital photographs documenting the condition of the habitat provided
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop acres on soils that are hydric and/or significantly water saturated during the growing season and are located on the low side or down slope portion of a field that receives hydrologic surface flow from the remainder of the field. Surface flow could be a result of irrigation or rainfall. Selected areas should be capable of being flooded through the use of a water control structure or other means.
- ☐ Prior to implementation, assess habitat condition using Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of wildlife habitat evaluation with participant and discuss range of management alternatives that would improve wildlife habitat conditions
- ☐ Prior to implementation, develop Wildlife Habitat Management Plan for targeted suite of species
- ☐ Prior to implementation, meet with participant to review Wildlife Habitat Management Plan

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E647D

CONSERVATION STEWARDSHIP PROGRAM

Establish and maintain early successional habitat in ditches and bank borders

Conservation Practice 647: Early Successional Habitat Development /Management

APPLICABLE LAND USE: Crop (Annual & Mixed)

RESOURCE CONCERN: Animals

ENHANCEMENT LIFE SPAN: 5 year

Enhancement Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

Criteria:

This enhancement applies to crop, pasture, or range land use acres with existing ditches and ditch borders where adequate naturally occurring vegetation is not present.

- Develop a wildlife habitat management plan for the suite of species targeted.
- Allow ditches and bank borders to re-vegetate to naturally occurring vegetation.

- Ditch borders will be a minimum of 20 feet wide and a maximum 60 feet wide.
- In circumstances where woody vegetation exists immediately adjacent to a farm ditch (e.g., such as along a spoil bank), an adjoining minimum 20 feet early successional, native vegetative border will also be established.
- Once established, ditches and borders may not be treated more than once every two years and may not be mowed, disked, grazed, dredged, cleaned, or sprayed with broadcast herbicides, or otherwise disturbed between treatments.
- Encroaching undesired woody vegetation may be controlled between the two treatment periods through spot spraying with approved herbicides.
- For the two approved treatments, light disking, mowing or herbicides may be used to control vegetation next to designated ditches, along ditch banks and borders.
    - These treatments must be applied outside of the primary wildlife ground nesting season.
    - Only herbicides approved for appropriate site conditions shall be applied.
    - Herbicides shall be applied following manufacturers label requirements.
- Grazing is not permitted unless a grazing management plan is in effect.
- Multiple ditch borders on the same property must have varying maintenance schedules.
- Invasive species such as kudzu, cogongrass, Chinese tallow tree, etc. that may become established in the border area must be controlled by spot spraying with an approved herbicide.
- A Wildlife Habitat Evaluation Guide (WHEG) specific to shallow water habitat on cropland, must be used to show that implementation of the Enhancement will improve wildlife habitat value from fair (planning criteria = 0.5) to good (planning criteria greater than 0.5 and less than or equal to 0.6) or from good to very good (planning criteria greater than 0.6).

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant Will:

- ☐ Prior to implementation, meet with NRCS to review results of the wildlife habitat assessment conducted by NRCS and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, meet with NRCS to obtain and review the Wildlife Habitat Management Plan.
- ☐ During implementation, follow the Wildlife Habitat Management Plan.
- ☐ During implementation, maintain field log to include:
  - o Type of crop(s) grown.
  - o Harvest date of crops grown on the applicable acres.
  - o Date/time and description of all habitat management actions taken.
  - o Digital photographs documenting the condition of the habitat provided.
- ☐ After implementation, provide the field log to NRCS for review to verify enhancement was implemented to meet criteria.

NRCS Will:

- ☐ As needed, provide additional technical assistance to the participant.
- ☐ Prior to implementation, verify this enhancement will be applied to crop, pasture, or range acres with existing ditches and ditch borders where adequate naturally occurring vegetation is not present.
- ☐ Prior to implementation, assess habitat condition using the Wildlife Habitat Evaluation Guide to calculate current WHEG score and anticipated WHEG score after implementation of Enhancement. **Existing WHEG score = _____ Planned Post Implementation WHEG score = _____**
- ☐ Prior to implementation, review results of the wildlife habitat evaluation with the participant and discuss range of management alternatives that would improve wildlife habitat conditions.
- ☐ Prior to implementation, develop a Wildlife Habitat Management Plan for targeted suite of species.
- ☐ Prior to implementation, meet with the participant to review the Wildlife Habitat Management Plan.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ After implementation, reassess habitat condition using Wildlife Habitat Evaluation Guide; **Post Implementation WHEG score = _____**
- ☐ After implementation, review field log to verify enhancement was implemented to meet criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

CONSERVATION STEWARDSHIP PROGRAM

E666A

Maintaining and improving forest soil quality.

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Soil, Air

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

Criteria

- States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.
- Update or modify the Forest Management Plan to include the following guidelines for forest soil quality management, as appropriate for the site.
    - Limit the area of compacted soils
        - Operate equipment on established roads and trails and minimize travel into the general forest area
        - Operate equipment on woody debris (slash) in areas with sensitive or wet soils
        - Sequence forest management activities (back to front) to limit the number of equipment passes

- Use smaller and lighter equipment, track equipment, low PSI tires, and lighter loads. Where appropriate, use mules, draft horses or other animals for moving harvested trees
- Restore heavily compacted areas (e.g., by sub-soiling or other mechanical method)

o Limit impacts of roads and landings

- Avoid disturbing natural drainage channels (e.g., design road locations to minimize stream crossings and diversions)
- Roads and landings occupy 5% or less of total wooded acreage
- Establish cover on roads and landings that are not in use

o Limit soil disturbance and control erosion

- Avoid disturbing forest litter and the soil surface
- Protect roads using water bars/rolling dips
- Establish cover on disturbed areas
- Retain downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention

o Maintain favorable conditions for forest growth

- Control the amount of road use, and off-road travel, to prevent erosion, compaction, and disturbance of the soil surface
- Establish cover on any disturbed areas
- Monitor the forest area for signs of insect damage, tree diseases, invasive plants, or other impacts on forest growth and health

o Retain and enhance carbon storage to support soil ecologic functions

- Follow stocking guidelines to maintain tree canopy cover (i.e., between the A and B lines of stocking guides at a minimum; preferably closer to the A line). See the stocking chart shown below.
- Add woody material to the soil by girdling or cutting non-merchantable trees or trees of undesired species
- Use extended rotations to keep carbon on the site for a longer period

CONSERVATION STEWARDSHIP PROGRAM

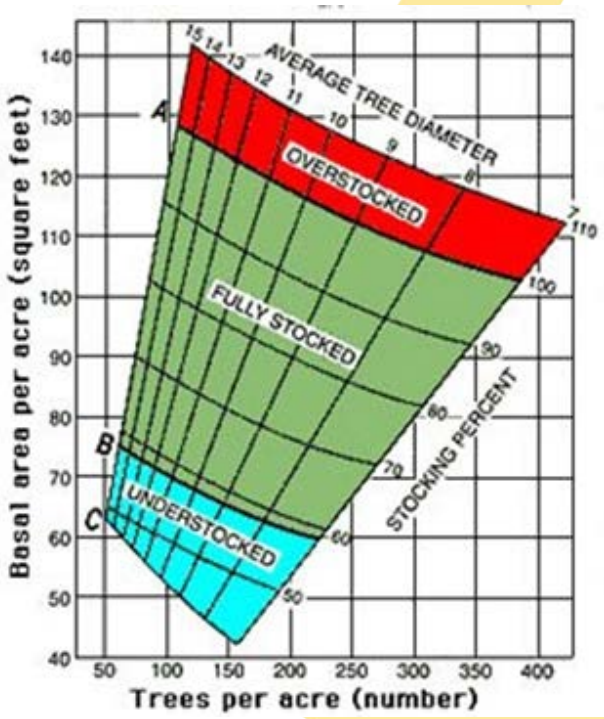
- Retain fallen trees, branches, snags, downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention, in quantities as specified below, or by the NRCS State Office.
  - For western conifer forests, maintain coarse woody residue:
    - that is greater than 3" in diameter,
    - left lying on the soil surface, and
    - which meets the post-harvest target levels of the following chart:

	Habitat Type	Target tons per acre of coarse woody debris
Dry Forests	Ponderosa pine types	5-13 tons/acre
⇕	Douglas-fir types	7-14 tons/acre
	Grand fir types	7-14 tons/acre
Moist Forests	Western hemlock types	16-33 tons/acre

- Maintain soil productivity by soil testing and fertilization if needed (including options for fertilizing with manure, biochar, or other organic materials).
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/ stocking guides.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.

- Refer to WIN-PST criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) and comply with applicable State and local laws if an herbicide will be used.
- Time tree girdling or felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) to protect soil and site resources from vehicle impacts. Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.

Figure 1: Stocking Chart *showing tree size and density scales indicating when forests are overstocked (too crowded), fully stocked (providing good growth), and understocked (trees do not fully utilize the site). Stocking guides were developed by Gingrich (1967).*



CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- ☐ Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard or appropriate state Job Sheet and use this information to meet the criteria of this enhancement.

- ☐ Prior to implementation, have a current or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for rehabilitating existing soil resource damage including compaction, ruts, puddling, erosion, downslope soil movement, exposed mineral soil, and depletion of the forest floor. It will also address rehabilitation for any water resource concerns such as diverted streams or intermittent flows. It will assess road layout and provide guidance on practices to correct any erosion or hydrologic impacts. Have the FMP available for NRCS review.

- ☐ Prior to implementation, arrange for soil tests to be conducted, one per each five acres. The FMP will include guidance for correcting any significant nutrient deficiencies.

- ☐ Prior to implementation, arrange for a forestry specialist to evaluate the stand and perform site-specific marking of areas to be seeded with cover plantings, locations where water control is needed, and trees that are to be girdled for snag creation.

- ☐ Prior to implementation, be aware of the state's Forestry Best Management Practices (BMP's) so they can be followed to protect the site and maintain soil and water quality.

- ☐ Prior to implementation, be aware of the current stocking level of trees on the site and the target level of stocking to maintain as part of this enhancement. This information should be detailed in the Forest Management Plan.

- ☐ During implementation, maintain the stand in a fully stocked condition using the appropriate stocking chart, between the A and B lines (see figure 1). The target stocking level should be between the A and B line, but closer to the A line.

- ☐ During implementation, follow state BMP guidelines and any additional guidance from the NRCS State Office to protect trails, roads and landings from soil loss or damage. Re-vegetate these disturbed areas or close them off to traffic to allow natural vegetation to grow on these areas.

- ☐ During implementation, spread tops and limbs across the site during any tree reduction operations to protect the soil.
- ☐ After implementation, provide the following information to NRCS; dates completed, methods used, representative post-treatment photos, and a map delineating the treated acres.

NRCS will:

- ☐ Prior to implementation, aid with interpretation of a current or updated FMP on acres targeted by this enhancement.
  - o Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - o Forest Stand Improvement (Code 666)
  - o Integrated Pest Management (Code 595)
  - o Forest Trails and Landings (Code 655)
  - o Access Road (Code 560)
- ☐ As needed, prior to implementation, NRCS will provide technical assistance in:
    - o Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and will discuss the details with the participant.
- ☐ Prior to implementation, discuss the requirement to follow the state's Forestry Best Management Practices (BMPs).
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666D

CONSERVATION STEWARDSHIP PROGRAM

Forest management to enhance understory vegetation

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants, Animals, Water

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages the structure and composition of overstory and understory vegetation to:

- Reduce vulnerability to damage by insects and diseases of forest trees. Canopy gaps and open understory allow for air circulation that reduces the incidence of disease, and the improved health of the residual trees increases their ability to withstand insect attacks
- Managing the understory vegetation will also reduce the risk of wildfire and promote development of herbaceous plants that benefit wildlife.
- Capture additional moisture and filters the water through the vegetation and soil.
- Managing the understory vegetation will increase available water to plants, minimize run-off and erosion, improve water quality, and limit nutrient entry into ground water.
- Reducing the number of trees per acre provides canopy openings that allow sunlight to reach the forest floor and promote the growth of herbaceous plants, improving wildlife shelter and cover in the forest understory.

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

Criteria:

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States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.
- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), and Herbaceous Weed Control (Code315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard.

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Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

- The acres planned must have an "acceptable growing stock" level of at least the B line on an appropriate stocking chart.
- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
  a. Excessive volatile live vegetation and woody debris –When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
  b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
  c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required provided the fuel continuity is disrupted.
  d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- ☐ Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- ☐ Prior to implementation, develop an understanding of management practices that reduce a dense understory of small trees and brush, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- ☐ Prior to implementation, work with a professional forester to prepare or update a current Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will include guidelines for thinning the stand and maintaining fully stocked conditions as specified in enhancement criteria. Depending on the resource concern addressing the FMP will also include recommended practices for managing understory vegetation to:
  - o Minimize risks of insect and disease outbreaks.
  - o Include recommended practices for managing understory vegetation to favor moisture infiltration.
  - o The FMP will also include recommended practices for managing understory vegetation to favor wildlife cover and shelter.
  - o Include recommended practices for managing understory vegetation to capture nutrients.
- ☐ Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - o Brush Management (Code 314)
  - o Forest Trails and Landings (Code 655)
  - o Herbaceous Weed Control (Code 315)
  - o Integrated Pest Management (Code 595)
  - o Woody Residue Treatment (Code 384)
  - o Prescribed Burning (Code 338)
- ☐ Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- ☐ Prior to implementation, work with a professional forester who will mark trees and groups of trees to be removed or killed, and who will develop a strategy for controlling undesirable understory vegetation.

CONSERVATION STEWARDSHIP PROGRAM

- ☐ Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- ☐ During implementation, follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and specifications provided by NRCS, to ensure that:
  - o Trees are removed, killed, or retained to achieve all planned purposes and landowner objectives.
  - o The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
  - o The operation avoids or minimizes damage to desirable vegetation.
- ☐ During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- ☐ During implementation, reduce stand stocking to correspond with the B-line of an appropriate stocking chart, retaining trees with larger, healthy crowns and undamaged trunks. If tree removal is not an option, reduce density by killing selected trees through girdling and/or chemically treatments.
- ☐ During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions. If prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a state approved prescribed burn plan. If using chemical methods, follow application and timing recommendations from an approved source.
- ☐ During implementation, limit the size of debris piles to minimize wildfire hazards.
- ☐ During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, take digital photos showing representative post-treatment conditions.
- ☐ After implementation, notify NRCS that the work has been completed and make treatment documentation records available for NRCS review and certification.

NRCS will:

- ☐ Prior to implementation, assist with interpretation of a current or updated FMP for sites where this enhancement will be applied.
- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.

CONSERVATION STEWARDSHIP PROGRAM

- o Brush Management (Code 314)
- o Herbaceous Weed Control (Code 315)
- o Forest Stand Improvement (Code 666)
- o Woody Residue Treatment (Code 384)
- o Forest Trails and Landings (Code 655)
- o Integrated Pest Management (Code 595)
- o Prescribed Burning (Code 338)

- ☐ Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ During implementation, provide technical assistance if requested by the participant.
- ☐ After implementation, review treatment documentation records and certify that the enhancement was completed according to specifications in this enhancement, and in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666E

CONSERVATION STEWARDSHIP PROGRAM

Reduce height of the forest understory to limit wildfire risk

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plants

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- The enhancement will be applied to sites which have an uncharacteristically dense understory of shrubs and small trees that limit development of ground cover.

CONSERVATION STEWARDSHIP PROGRAM

- Develop or update a forest management plan in consultation with NRCS personnel and a professional forester to direct the management of the property.
- Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
- Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
- Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to avoid overstocked conditions using approved silvicultural/stocking guides.
- Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (315).
- Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).
- The acres planned must have an “acceptable growing stock” level of at least the B line on an appropriate stocking chart.

CONSERVATION STEWARDSHIP PROGRAM

- This enhancement requires implementation of the following activities (a through d) in the area where the enhancement applies.
  a. Excessive volatile live vegetation and woody debris – When volatile, live grasses and shrubs and/or woody debris are present, a reduction of these fuels may be accomplished by using heavy duty brush cutters or similar equipment.
  b. Closed canopy – When trees form a continuous closed canopy, thin the stand to allow for heat escape and to improve the health of residual trees and understory vegetation. Open the canopy by cutting or killing selected trees to allow sunlight to reach the forest floor. Reduce slash from the cut trees by cutting off the limbs as needed. An alternative is to use single tree injections to reduce the density of poor-quality trees and open up the canopy.
  c. Ladder fuels – When ladder fuels form connections between the ground and the higher levels of the canopy, thus increasing the risk of fire spreading into tree crowns, break the continuity of fuel between the ground and the upper canopy. Complete removal is not required as long as the continuity is disrupted.
  d. Undesirable Vegetation – Use control measures to reduce or eliminate undesirable vegetation and favor desirable vegetation for the site.
- Minimize damage to residual trees during the treatment process.
- If machinery is being used, operate under dry conditions when the machinery will not cause rutting and/or soil compaction.
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

☐ Prior to implementation, work with a professional forester to develop or update a forestry management plan for the property.

☐ Prior to implementation, work with a professional forester to include **current** species, cover type, and size class distribution for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **desired** species, cover type, and size class distribution for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated in the plan.

☐ Prior to implementation, work with a professional forester to include in the updated or developed plan to identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, work with a professional forester using available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, work with professional forester and NRCS to delineate on a map the treatment areas and dates.

☐ Prior to implementation, discuss with professional forester or NRCS if NRCS Conservation Practice Standard Forest Trails and Landings (Code 655) will be necessary for access or to reduce erosion from vehicles/equipment.

☐ Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris.

☐ Prior to implementation, discuss with professional forester and NRCS if NRCS Conservation Practice Standard Prescribed Burning (Code 338) to appropriately treat slash and debris.

☐ During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.

CONSERVATION STEWARDSHIP PROGRAM

☐ During implementation, keep evidence to support the treatment activities were completed using representative photos. Location of representative photos must be indicated on the map delineating treated areas.

☐ After implementation, notify NRCS that treatment has been completed and submit pictures and map to support this.

NRCS will:

☐ Prior to implementation, provide and discuss with participant, as needed, NRCS Conservation Practice Standards Forest Trails and Landings (Code 655), Woody Residue Treatment (Code 384), and Prescribed Burning (Code 338).

☐ Prior to Implementation, verify that participant plan has been developed or updated by a professional forester.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** species, cover type, and size class distribution for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester to include **current** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and includes **desired** crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol for stands to be treated.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and identifies and retains preferred tree and understory species to achieve all planned purposes and landowner objectives to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

☐ Prior to implementation, verify that participant plan has been developed or updated by a professional forester and uses available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained to get from **current to desired** conditions for the stands to be treated. This would be part the silviculture prescription.

CONSERVATION STEWARDSHIP PROGRAM

☐ Prior to implementation, assist the landowner, as needed, to delineate on a map the treatment areas and dates of treatment.

☐ During Implementation, verify any planned changes in plan will meet the enhancement criteria.

☐ After Implementation, verify that the treatment has been completed and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666G

CONSERVATION STEWARDSHIP PROGRAM

Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 YEARS

Enhancement Description:

Opening the tree canopy along roads ("daylighting") and providing space between ground vegetation and tree crowns minimizes the spread of wildfires that often start along roads and improves wildlife habitat and food sources for many species. Some trees near a forest road are removed through harvesting, cutting, mulching, or another option available at the site, with the objective of creating a partially open forest canopy bordering the road. A semi-open canopy allows more sunlight to reach the forest floor to promote herbaceous understory plants and reduces maintenance needs by allowing moisture to evaporate from roads. The reduced canopy and herbaceous understory limit woodland fuel buildup and reduce fire intensity.

Criteria:

States will apply general criteria from the NRCS National Conservation Practice Standard (CPS) Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Apply the enhancement to sites where vegetation on roadsides presents a fire risk, is inadequate for wildlife habitat, or is detrimental to road maintenance. Treat a strip of forest on both sides of the road, as needed and if feasible. Implement the enhancement for a distance of at least 35 feet into the forest stand from the edge of the road, and extend the distance as needed up to 100 feet based on slope, aspect, soils, fuel type, etc. Use criteria in NRCS CPS Fuel Break (Code 383).

- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation

CONSERVATION ENHANCEMENT ACTIVITY

E666G

CONSERVATION STEWARDSHIP PROGRAM

Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.

CONSERVATION STEWARDSHIP PROGRAM

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.
- Wetland compliance and highly erodible land regulations must be followed.
- Trees removed as part of the treatment process that have marketable quality may be sold. Retain desirable species with large healthy crowns, and trees and shrubs that provide a diversity of wildlife food sources. Remove trees that are:
    - At high risk of mortality or failure (unless retained as a wildlife tree at a safe distance from the road)
    - Of low crown vigor
    - Of poor stem form and quality
    - Less-desirable species.
- Trees that cannot be sold may be removed by cutting, mulching, firewood distribution, or other means to reduce the canopy and allow sunlight to reach the forest floor. Trees further away from the road may be killed and left standing as snags, if they will not fall onto the road.
- Minimize damage to residual trees during the daylighting process.
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) Brush Management (Code 314), or Herbaceous Weed Control (Code 315) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384), to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

CONSERVATION STEWARDSHIP PROGRAM

- The understory vegetation can be maintained by prescribed burning where appropriate. Use NRCS CPS Prescribed Burning (Code 338). If prescribed burning is not an option, alternative methods may be used to manage the understory vegetation, such as mowing or fall disking.

- The daylighted area may be treated with herbicides to control noxious and invasive plants and undesirable woody vegetation to promote herbaceous plants. Vegetation may be treated by chemical methods such as spraying or single stem treatments, or mechanical methods like a heavy-duty brush cutter or similar equipment. Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595), Brush Management (Code 314), or Herbaceous Weed Control (Code 315)

- No daylighting activities should take place during the nesting season for ground nesting birds.

Documentation and Implementation Requirements:

CONSERVATION STEWARDSHIP PROGRAM

Participant will:

- Prior to implementation, review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) which contains information needed to meet criteria for this enhancement.
- Prior to implementation, develop an understanding of management practices that reduce tree density, and the types of understory vegetation that will be encouraged by these practices. (Request NRCS technical assistance, as needed.)
- Prior to implementation, recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - Brush Management (Code 314)
  - Herbaceous Weed Control (Code 315)
  - Integrated Pest Management (Code 595)
  - Woody Residue Treatment (Code 384)
  - Prescribed Burning (Code 338)
- Prior to implementation, acquire all necessary approvals and permits (i.e. local, state, or federal, as applicable).
- Prior to implementation, work with a professional forester who will mark trees and groups of trees to remove and will develop a strategy for controlling undesirable understory vegetation.
- Prior to implementation, if prescribed burning will be used, work with NRCS and a professional forester or biologist to obtain a prescribed burn plan. If chemical methods will be used, obtain recommendations from an approved source.
- Prior to implementation, take pre-treatment photos of the site to show representative conditions.
- During implementation, follow criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) and specifications provided by NRCS, to ensure that:
  - Overstory trees are removed or retained to achieve all planned purposes and landowner objectives.
  - The desired spacing, density, size-class distribution, number of trees, and amount of understory is achieved.
  - The operation avoids or minimizes damage to desirable vegetation.

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- During implementation, follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- During implementation, treat a strip of forest on both sides of the road, if needed and feasible. Implement the enhancement for a distance of at least 35 feet into the forest stand from the edge of the road, and extend the distance as needed up to 100 feet from the road based on slope, aspect, soils, fuel type, etc.
- During implementation, focus on retaining healthy trees and when available retain trees that provide wildlife benefits such as oaks, hickories, etc.
- During implementation, remove trees that are at risk of mortality, trees with low crown vigor, trees with poor form and quality, and less-desirable species.
- During implementation, control undesirable competing vegetation using appropriate methods for the tree species and site conditions.
- During implementation, limit the size of debris piles to minimize wildfire hazards.
- During implementation, as needed, evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria.
- After implementation, take digital photos showing representative post-treatment conditions.
- After implementation, notify NRCS that the work has been completed and make treatment documentation available for NRCS review and certification.

NRCS will:

- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - Fuel Break (Code 383)
  - Brush Management (Code 314)
  - Herbaceous Weed Control (Code 315)
  - Forest Stand Improvement (Code 666)
  - Woody Residue Treatment (Code 384)
  - Forest Trails and Landings (Code 655)
  - Integrated Pest Management (Code 595)
  - Prescribed Burning (Code 338)
- As needed, prior to implementation, NRCS will provide technical assistance in:

CONSERVATION STEWARDSHIP PROGRAM

- Interpreting enhancement criteria relative to tree species to retain and remove or kill, and strategy for controlling undesirable understory vegetation.
- Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

- Prior to implementation, ensure that the participant has an appropriate prescribed burn plan, herbicide recommendations from an approved source and an understanding of how these practices will be applied on the property.
- Prior to implementation, provide and explain the state's Forestry BMP guidelines.
- During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- During implementation, provide technical assistance if requested by the participant.
- After implementation, review documentation and photographs to verify the enhancement was completed according to specifications in this enhancement and NRCS Conservation Practice Standard Forest Stand Improvement (Code 666).

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

USDA United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666H

CONSERVATION STEWARDSHIP PROGRAM

Increase on-site carbon storage

CONSERVATION PRACTICE: 666 - Forest Stand Improvement

APPLICABLE LAND USE: Forest; Associated Ag Land; Farmstead

RESOURCE CONCERN: Soil, Air

ENHANCEMENT LIFE SPAN: 10 years

Enhancement Description

Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic matter.

Criteria

- Apply all of the following activities:
  - Retain all snags and downed woody debris of 6" diameter or larger at the base.
  - Identify leave-trees or clumps of trees that will be retained on site throughout their life span. These would ideally be trees that also provide wildlife habitat (e.g., future cavity/den trees, species that develop loose bark at older ages, mast producers, etc.).
  - Close unneeded roads and limit off-road vehicular traffic to avoid displacing the forest litter layer.

- Apply at least one activity from among the following as appropriate for the site:
  - Transition from even-aged to uneven-aged management.
  - Use regeneration methods (e.g., group selection, shelterwood, seed-tree, expanding gap) that call for retention of mature trees during the period when advanced regeneration develops.
  - Adopt techniques for maintaining and/or improving soil quality, specifically retention or organic carbon.
  - Maintain canopy cover to shade the forest floor and avoid hastening decomposition.

- During forest management activities, apply the following criteria:
    - Identify and retain preferred tree and understory species to achieve all planned purposes and landowner objectives.
    - Use available guidelines for species and species groups to determine spacing, density, size-class distribution, number of trees, and amount of understory species to be retained. Schedule treatments to maintain the stand, as much as possible, consistent with chosen regeneration method, in a fully stocked condition based on appropriate stocking guide.
    - Describe the current and desired future condition of each stand that will be treated. Include the species, cover type, and size-class distribution. Stocking will be described in terms of crop trees per acre, basal area per acre, trees per acre, between-tree spacing, or by any other appropriate and professionally accepted density or stocking protocol.
    - Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Refer to Conservation Practice Standard Forest Trails and Landings (Code 655) and Road/Trail/Landing Closure and Treatment (Code 654).
    - The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

Documentation and Implementation Requirements

Participant will:

☐ Prior to implementation:

- develop a new or updated forest management plan (FMP) that may reflect a change in management objectives.
- review NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) that contains information needed to meet criteria for this enhancement.
- develop an understanding of the management that this is required to increase carbon storage appropriate for the resource setting to include the following activities:
    - implement forest management activities that begin a transition from even-aged to uneven-aged management.
    - retain dead wood and select trees or clumps of trees that are intended to be left on the site throughout their life span.
    - use regeneration methods (e.g., group selection, shelterwood, seed-tree, expanding gap) that require retention of mature trees during the period when advanced regeneration develops.
    - adopt techniques for maintaining and/or improving soil quality, specifically retention of organic carbon.

  - maintain canopy cover to shade the forest floor and avoid hastening decomposition.
- For forest lands, work with professional forester to prepare or update a current FMP that includes activities required to implement this enhancement. NRCS State Office will determine if a FMP will be required for Associated Ag Land or Farmstead settings. (Request NRCS technical assistance, as needed.)
- Arrange to have a professional forester or wildlife specialist, as part of developing or updating an FMP:
  - identify and map areas, selected trees, or groups of leave trees that can serve as wildlife habitat and that are intended to be left on site throughout their lifespan.
  - describe amounts and condition of standing snags and fallen woody debris with 6" or larger basal diameter.
  - identify and map trails or roads that can be planned for closure.
- Recognize that other NRCS Conservation Practice Standards may be needed to apply this enhancement. These may include:
  - Forest Trails and Landings (Code 655)
  - Road/Trial/Landing Closure and Treatment (Code 654)
  - Woody Residue Treatment (Code 384)
- Acquire all necessary approvals and permits (i.e., local, state, or federal, as applicable).

☐ During implementation:

- Follow FMP guidelines follow state-approved Forestry Best Management Practices (BMPs) to protect streams, water quality, and minimize soil loss.
- Follow FMP guidelines, criteria in NRCS Conservation Practice Standard Forest Stand Improvement (Code 666), and in specifications provided by NRCS, to ensure that:
  - overstory tree and understory species are retained to achieve all planned purposes and landowner objectives.
  - establish required spacing, density, size-class distribution, number of trees, and amount of understory species to be retained.
  - schedule treatments to maintain the stand, as much as possible, consistent with the chosen forest regeneration method, in a fully stocked condition based on appropriate stocking guide.
  - avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- Evaluate and review with NRCS any planned changes to verify they meet the enhancement criteria, as needed.

☐ After implementation:

- Ensure that retained leave areas are properly protected.
- Update the FMP to documentation treatment acres, completion dates and methods, and document representative treatments with digital photos.

- Notify NRCS that the work has been completed and make treatment documentation available for NRCS review and certification.

CONSERVATION STEWARDSHIP PROGRAM

NRCS will:

☐ Prior to implementation:

- Provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
  - Forest Stand Improvement (Code 666)
  - Woody Residue Treatment (Code 384)
- Provide technical assistance in, as needed:
  - Guiding the proper sequence and timing of planned FMP treatment activities to meet requirements to maintain and increase on-site carbon storage.
  - Preparing specifications for applying this enhancement for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.
- Ensure that the participant has a current and complete FMP describing all treatment activities for the resource setting.

☐ During implementation:

- Provide technical assistance if requested by the participant.
- Evaluate any planned changes to verify they meet the enhancement criteria.

☐ After Implementation:

- Verify the enhancement was implemented according to the NRCS Conservation Practice Standard Forest Stand Improvement Standard (Code 666) specifications and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666I

CONSERVATION STEWARDSHIP PROGRAM

Crop tree management for mast production

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land, Farmstead

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Forest stand improvement using crop tree management techniques to increase mast production.

Criteria

- States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.
- Identify the number of mast crop trees to be developed based on site productivity and spacing guidelines for the mast tree species. See State guidelines.
- Crop tree crowns should be in the upper level of the forest canopy (dominant and/or codominant trees), and not suppressed by other tree crowns.
- Cut or kill all trees whose crowns touch the crown of the crop tree on four sides (three sides if adjacent to another crop tree), and leave additional space for large crown development of mast crop trees. Crop trees will have >15 feet of space on all treated sides.
- Retain a diversity of tree species to reduce the potential impact of an epidemic event (e.g. insect outbreak) that may kill some/all trees.

- Trees that are below the crown of the crop tree or are not affecting crown development will be left to provide protection from wind damage, limit epicormic sprouting, and provide diversity for wildlife habitat.
- Trees removed that have marketable quality can be sold.
- All killed trees shall be left standing to provide wildlife habitat, except where snags will become a safety hazard (within 100 feet of a building, power line, road, etc.) or create a fire hazard. Snags that must be cut for safety reasons shall be left on site to become coarse woody debris on the forest floor (unless they create a fire hazard).
- As applicable, additional actions include:
    - Cutting damaging vines away from crop trees
    - Treatment of invasive plants that may be stressing crop trees
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.
- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or

when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (Code 338).

- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements

Participant will:

- ☐ Prior to implementation, identify the number of dominant and/or codominant mast producing crop trees to be developed based on site productivity and spacing guidance for mast trees, as required in state specific guidelines. (NRCS will provide technical assistance, as needed.)
- ☐ During implementation, release all crop trees on all sides by killing competing trees within 15 feet of the crop tree's crown/canopy.
- ☐ During implementation, retain a diversity of tree species, cut damaging vines away from crop trees, and treat invasive plants that may stress crop trees.
- ☐ During implementation, leave all killed trees (unless removed as a merchantable product) standing to provide additional wildlife habitat, except where snags could become a safety hazard. Trees that must be cut for safety reasons will be left on site to become coarse woody debris on the forest floor.
- ☐ During implementation, protect the site from plant and animal pests, fire, and adverse impacts to the soil resource.

NRCS will:

- ☐ Prior to implementation, as needed, provide technical assistance in determining sites for enhancement implementation that meet specified criteria, including the number of crop trees per acre needed and the spacing of those trees.
- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement (as applicable for the site):
    - o Forest Stand Improvement (Code 666)
    - o Integrated Pest Management (Code 595)
    - o Forest Trails and Landings (Code 655)
    - o Access Road (Code 560)
    - o Woody Residue Treatment (Code 384)
    - o Prescribed Burning (Code 338)

CONSERVATION STEWARDSHIP PROGRAM

- ☐ During implementation, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, document the number of crop trees per acre and average spacing and verify the post treatment stand conditions meet the specifications developed for the crop tree release activity.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666J

CONSERVATION STEWARDSHIP PROGRAM

Facilitating oak forest regeneration

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land

RESOURCE CONCERN: Plants, Animals

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (e.g., a regeneration cut). After a regeneration cut, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of oak seedlings and saplings. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Develop or update a forest management plan (FMP) in consultation with NRCS personnel and a professional forester to direct the management of the property. The FMP will include guidelines for the amount of advanced oak regeneration needed to achieve the desired future condition. It will describe the types of competition or other stressors that threaten oak survival and recruitment in the area, and recommend facilitating controls such as prescribed burning, chemical, and mechanical treatments to achieve desired outcomes. The FMP will also include guidelines for future inspection and monitoring, types of forest health impacts or stand damage to look for during inspections, and potential supplementary activities that may be needed to achieve additional oak recruitment and regeneration.

This enhancement may be applied only to forest stands that have already had a seed tree, shelterwood, thinning, or other silvicultural treatment designed to regenerate oak. The stands must contain an adequate amount of oak regeneration in the seedling and/or sapling stages, sufficient to achieve stand objectives if they survive and become fully established. The stands must also have evidence that the oak regeneration is not "free to grow" due to the presence of competing species. This enhancement is not appropriate for stands that have reached the pole timber size class because they are considered fully established at that point and stand management activities will be different.

- A forestry specialist will inspect the stand and identify existing or potential species of harmful insects, tree diseases, and invasive plants, as well as other biotic and abiotic (i.e. ice storms, drought, flooding, etc.) impacts on forest growth, health, structure and/or composition.

- A forestry specialist will conduct regeneration surveys according to methods described in the NRCS National Forestry Handbook, Title 190, Section 636.2.

- The forestry specialist will make recommendations for short-term treatments as needed. A skilled laborer will implement appropriate activities such as applying mechanical and spot chemical treatments, and/or installing tree protection.

- In appropriate settings, prescribed burning may be used to control vegetative competition after oak root systems are sufficiently established to re-sprout after a fire. With the recommendation of a forestry specialist, use NRCS Conservation Practice Standard Prescribed Burning (Code 338), or CSP Enhancement E338B, Short-interval burn.

- The forestry specialist will recommend additional practices as needed to correct undesirable forest health conditions. Practices may include: NRCS Conservation Practice Standards Integrated Pest Management (Code 595), Brush Management (Code 314), Herbaceous Weed Control (Code 315).

- Forest stands lacking sufficient oak regeneration with no surrounding seed-producing oaks may need an enrichment planting of oak. Use NRCS Conservation Practice

Standard Tree and Shrub Establishment (Code 612). Prescribed burning may not be appropriate where trees have been recently planted.

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Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, the participant will obtain a new or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will identify regeneration needs, competition that impedes oak regeneration and recruitment, other forest health concerns, and activities recommended for implementation. The participant will make the FMP available for NRCS review.
- Prior to implementation, arrange for a forestry specialist to inspect the stand and perform the tasks identified in this enhancement.
- Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard and other applicable implementation documentation and use the information to meet the criteria of this enhancement.
- During implementation, the participant and the forestry specialist will ensure that regenerating oak trees are protected from any damage.
- During implementation, notify NRCS if there are any planned changes, to verify they meet the enhancement criteria.
- After implementation, notify NRCS that the work has been completed, and make the following information available to NRCS: dates that inspection was conducted, methods used, and the treatments applied to remove competition and protect young oaks.

NRCS will:

- Prior to implementation, verify the enhancement activity is planned for acres that meet the criteria within the enhancement guide sheet. Verify that a forest stand improvement treatment to initiate oak regeneration was previously applied, that regenerating seedling and/or sapling oaks are present, and that oak survival is threatened by competing species and/or other environmental stressors.
- Prior to implementation, provide assistance with interpretation of a new or updated FMP on acres targeted by this enhancement.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
    - Forest Stand Improvement (Code 666)

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- Integrated Pest Management (Code 595)
- Prescribed Burning (Code 338)
- Brush Management (Code 314)
- Herbaceous Weed Control (Code 315)
- Tree/Shrub Establishment (Code 612)
- Tree/Shrub Site Preparation (Code 490)

☐ As needed, prior to implementation, NRCS will provide technical assistance by:

- Preparing specifications for applying this enhancement for each site using approved guide sheets, implementation requirements, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and discussing the details with the participant.
- Providing methods for conducting regeneration surveys.

☐ During implementation, provide technical assistance if requested by the participant.

☐ During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.

☐ After implementation, certify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666L

CONSERVATION STEWARDSHIP PROGRAM

Forest Stand Improvement to rehabilitate degraded hardwood stands

Conservation Practice 666: FOREST STAND IMPROVEMENT

APPLICABLE LAND USE: Forest

RESOURCE CONCERN: Plant, Animal

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.). Some crop tree species will meet multiple objectives (oak, cherry, black walnut, tulip-poplar, pine, spruce).
- Crop trees will receive a crown-touching release: any undesirable trees touching a crop tree crown will be cut or killed.

- Areas of 0.25 acre or more with no crop trees will be clear-cut, up to 3 acres in size.
- Forest stand improvement activities will be planned and applied in a manner to meet the habitat requirements for wildlife species of concern as determined by the state's NRCS Wildlife Habitation Evaluation Guide (WHEG) and will be managed to achieve or maintain a value of 0.75 or greater.
- Invasive species will be controlled before tree cutting begins.
- Refer to criteria in NRCS Conservation Practice Standard Integrated Pest Management (Code 595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression. Time tree felling to avoid buildup of insect or disease populations.
- Treatment activities will be conducted during periods of the year that accommodate reproduction and other life-cycle requirements of the targeted wildlife and pollinator species.
- Retain a diversity of tree species, where possible, to reduce the potential impact of an epidemic event (e.g. insect outbreak) that may kill trees of some species.
- Trees removed that have marketable quality can be sold.
- Killed trees that do not interfere with tree regeneration shall be left standing to provide wildlife habitat, except where snags will become a safety hazard (within 100 ft. of a building, power line, road, etc.) or create a fire hazard. Snags that must be cut for safety reasons shall be left on site to become coarse woody debris on the forest floor (unless they create a fire hazard).
- As applicable, cut damaging vines away from crop trees
- Implement forest stand improvement activities in ways that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions. Protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. For temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- Use NRCS Conservation Practice Standard Access Road (Code 560), for more heavily used roads associated with forest stand improvement activities.

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- Where slash and debris will be generated, use NRCS Conservation Practice Standard Woody Residue Treatment (Code 384) to appropriately treat slash and debris, as necessary, to assure that it will not present an unacceptable fire, safety, environmental, or pest hazard. Remaining woody material will be placed so that it does not interfere with the intended purpose or other management activities. Do not burn vegetative residues except where fire hazard or threats from diseases and insects are of concern or when other management objectives are best achieved through burning. When slash and other debris will be burned onsite use NRCS Conservation Practice Standard Prescribed Burning (code 338).
- The enhancement will comply with all applicable federal, state, and local laws and regulations, and with States' Forestry Best Management Practices for Water Quality.

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Documentation and Implementation Requirements:

Participant will:

- ☐ Prior to implementation, work with professional forester to develop forest management plan documenting which of the three methods will be used (crop tree release, group selection, or clear cut) and in what stands they will be implemented.
- ☐ Prior to implementation, work with professional forester and/or NRCS to determine ways to implement the enhancement that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- ☐ Prior to implementation, work with professional forester and/or NRCS to protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation.
- ☐ Prior to implementation, work with professional forester and/or NRCS if temporary access use NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.
- ☐ Prior to implementation, work with professional forester and/or NRCS to delineate areas to be treated on a map (s).
- ☐ Prior to implementation, work with professional forester and/or NRCS to complete an Implementation Requirements sheet for NRCS Conservation Practice Standard Forest Stand Improvement (Code 666). Depending on method(s) specified in the plan, address:
    - o Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.).
    - o Identify areas of 0.25 to 1 acre in size that will have group selection.
    - o Identify areas of 1-3 acres in size that will be clear cut.
    - o Specify how undesirable trees and shrubs will be cut or killed.

Stand #	Treatment Option

- ☐ Invasive species will be treated prior to implementation or concurrently with cut.

- ☐ During implementation, notify NRCS of any planned changes to verify they meet the enhancement criteria.
- ☐ During implementation, verify that killed trees/snags that do not interfere with regeneration are left standing or cut and left on site (if safety hazard).
- ☐ During implementation, cut damaging vines away from crop trees.
- ☐ After implementation, notify NRCS that implementation has been completed.

NRCS will:

- ☐ Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement.
  - o Integrated Pest Management (Code 595)
  - o Woody Residue Treatment (Code 384)
  - o Prescribed Burning (Code 338)
  - o Access Road (Code 560)

- ☐ Prior to Implementation, provide and explain, as needed, NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) and assist the participant in completing an Implementation Requirements sheet. Depending on method(s) specified in the plan address:
  - o Identify tree species (crop trees) that meet objectives for the stand (timber, wildlife, visual quality, etc.).
  - o Identify areas of 0.25 to 1 acre in size that will have group selection.
  - o Identify areas of 1-3 acres in size that will be clear cut.
- ☐ Prior to implementation, assist landowner to determine ways to implement the enhancement that avoid or minimize soil erosion, compaction, rutting, and damage to remaining vegetation, and that maintain hydrologic conditions.
- ☐ Prior to implementation, assist landowner to protect site resources by selecting the method, felling direction and timing of tree felling, and heavy equipment operation. Provide and document with Participant on NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) Implementation requirements sheet.
- ☐ Prior to implementation, if temporary access is needed, provide participant with NRCS Conservation Practice Standard Forest Trails and Landings (Code 655), to protect soil and site resources from vehicle impacts.

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- ☐ Prior to implementation, as needed, provide assistance in delineating treatment area on a map(s).
- ☐ Prior to implementation, verify that invasive species have been treated or treating concurrently with cut.
- ☐ Prior to implementation, Wildlife Habitat Evaluation Guide (WHEG) or State equivalent must be completed. **Existing condition WHEG score:_____ Planned after implementation WHEG score:_____**
- ☐ During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.
- ☐ After implementation, verify that killed trees/snags that do not interfere with regeneration are left standing or cut and left on site (if safety hazard).
- ☐ After implementation verify that damaging trees have been removed from crop trees.
- ☐ After implementation, Wildlife Habitat Evaluation Guide (WHEG) or State equivalent must be completed and have a value of 0.75 or greater. **After implementation WHEG score:_____**
- ☐ After Implementation, verify the enhancement was implemented according to the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) specifications and meets enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

United States Department of Agriculture

CONSERVATION ENHANCEMENT ACTIVITY

E666S

CONSERVATION STEWARDSHIP PROGRAM

Facilitating longleaf pine regeneration and establishment

Conservation Practice 666: Forest Stand Improvement

APPLICABLE LAND USE: Forest, Associated Ag Land

RESOURCE CONCERN: Plants, Animals

ENHANCEMENT LIFE SPAN: 10 Years

Enhancement Description

Facilitate longleaf pine regeneration and establishment following a forest stand improvement treatment for natural regeneration (e.g., a regeneration cut), or where longleaf has been previously planted. After a regeneration cut or a planting, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of longleaf pine. This enhancement will release seedling and sapling longleaf from competing invasive plants and other undesirable species. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in longleaf pine regeneration and establishment by providing for follow-up activities that require the expertise of a professional forester.

Criteria

States will apply general criteria from the NRCS National Conservation Practice Standard Forest Stand Improvement (Code 666) as listed below, and additional criteria as required by the NRCS State Office.

- Develop or update a forest management plan (FMP) in consultation with NRCS personnel and a professional forester to direct the management of the property. The FMP will include guidelines for the amount of advanced longleaf pine regeneration needed to achieve the desired future condition. It will describe the types of competition or other stressors that threaten longleaf survival and recruitment in the area, and recommend facilitating controls such as prescribed burning, chemical, and mechanical treatments to achieve desired outcomes. The FMP will also include guidelines for future inspection and monitoring, types of forest health impacts or stand damage to look for during inspections, and potential supplementary activities that may be needed to achieve longleaf establishment and recruitment.

- stands that have already had a seed tree, shelterwood, thinning, or other silvicultural treatment designed to regenerate longleaf pine. The stands must contain an adequate amount of longleaf regeneration or planted trees in the seedling and/or sapling stages, sufficient to achieve stand objectives if they survive and become fully established. The stands must also have evidence that the longleaf regeneration is not "free to grow" due to the presence of competing species. This enhancement is not appropriate for stands that have reached the pole timber size class because they are considered fully established at that point and stand management activities will be different.

- A forestry specialist will inspect the stand and identify existing or potential species of harmful insects, tree diseases, and invasive plants, as well as other biotic and abiotic (i.e. ice storms, drought, flooding, etc.) impacts on forest growth, health, structure and/or composition.

- A forestry specialist will conduct regeneration surveys according to methods described in the NRCS National Forestry Handbook, Title 190, Section 636.2.

- The forestry specialist will make recommendations for short-term treatments as needed. A skilled laborer will implement appropriate activities such as applying mechanical and spot chemical treatments.

- In appropriate settings, prescribed burning may be used to control vegetative competition after longleaf root systems are sufficiently established to re-sprout after a fire. With the recommendation of a forestry specialist, use NRCS Conservation Practice Standard Prescribed Burning (Code 338), or CSP Enhancement E338B, Short-interval burn.

- The forestry specialist will recommend additional practices as needed to correct undesirable forest health conditions. Practices may include: NRCS Conservation Practice Standards Integrated Pest Management (Code 595), Brush Management (Code 314), Herbaceous Weed Control (Code 315), etc..

- Forest stands lacking sufficient longleaf regeneration may need an enrichment planting of longleaf. Use NRCS Conservation Practice Standard Tree and Shrub Establishment (Code 612). Prescribed burning may not be appropriate where trees

- have been recently planted.

CONSERVATION STEWARDSHIP PROGRAM

Documentation and Implementation Requirements:

Participant will:

- Prior to implementation, the participant will obtain a new or updated Forest Management Plan (FMP) that includes activities required to implement this enhancement. The FMP will identify regeneration needs, competition that impedes longleaf regeneration and recruitment, other forest health concerns, and activities recommended for implementation. The participant will make the FMP available for NRCS review.
- Prior to implementation, arrange for a forestry specialist to inspect the stand and perform the tasks identified in this enhancement.
- Prior to implementation, review the NRCS Conservation Practice Standard Forest Stand Improvement (Code 666) conservation practice standard and other applicable implementation documentation and use the information to meet the criteria of this enhancement.
- During implementation, the participant and the forestry specialist will ensure that regenerating longleaf trees are protected from any damage.
- During implementation, notify NRCS if there are any planned changes, to verify they meet the enhancement criteria.
- After implementation, notify NRCS that the work has been completed and make the following information available to NRCS: dates that inspection was conducted, methods used, and the treatments applied to remove competition and protect young longleafs.

NRCS will:

- Prior to implementation, verify the enhancement activity is planned for acres that meet the criteria within the enhancement guide sheet. Verify that a forest stand improvement treatment to initiate longleaf regeneration, or longleaf planting, was previously applied, that regenerating seedling and/or sapling longleaf pines are present, and that longleaf survival is threatened by competing species and/or other environmental stressors.
- Prior to implementation, provide assistance with interpretation of a new or updated FMP on acres targeted by this enhancement.
- Prior to implementation, provide and explain the following NRCS Conservation Practice Standards as they relate to implementing this enhancement:
    - Forest Stand Improvement (Code 666)

- Integrated Pest Management (Code 595)
- Prescribed Burning (Code 338)
- Brush Management (Code 314)
- Herbaceous Weed Control (Code 315)
- Tree /Shrub Establishment (Code 612)
- Tree/Shrub Site Preparation (Code 490)

- As needed, prior to implementation, NRCS will provide technical assistance by:
  - Preparing specifications for applying this enhancement for each site using approved guide sheets, implementation requirements, technical notes, and narrative statements in the conservation plan, or other acceptable documentation, and discussing the details with the participant.
  - Providing methods for conducting regeneration surveys.
- During implementation, provide technical assistance if requested by the participant.
- During implementation, as needed, evaluate any planned changes to verify they meet the enhancement criteria.
- After implementation, certify that the enhancement was completed according to the NRCS Conservation Practice Standard Forest Stand Improvement (CPS 666) specifications and the enhancement criteria.

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name_____Contract Number _____

Total Amount Applied_____Fiscal Year Completed _____

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NRCS Technical Adequacy Signature Date