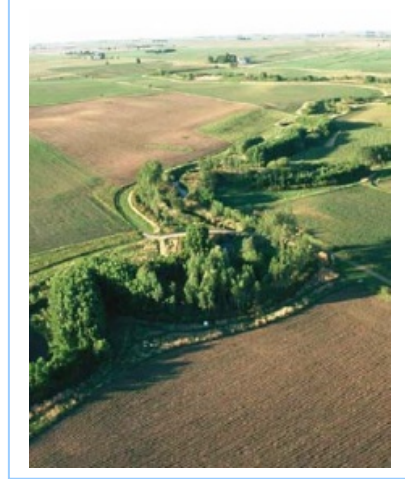




United States Department of Agriculture

Natural Resources Conservation Service



**CONSERVATION
STEWARDSHIP
PROGRAM**
Programmatic
Environmental Assessment
April 2020



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1 INTRODUCTION

The Conservation Stewardship Program (CSP) is a voluntary conservation program first authorized by Congress in the Food, Conservation, and Energy Act of 2008 (hereafter referred to as the 2008 Farm Bill). The Agricultural Improvement Act of 2018 (2018 Farm Bill) modified the CSP program that has been in place since about 2009, so the Natural Resources Conservation Service (NRCS) is publishing an interim final rule to implement those changes. Unless otherwise noted below, statutory program requirements remain the same for the 2018 Farm Bill.

The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies prepare environmental impact statements (EISs) for major Federal actions significantly affecting the quality of the human environment. When a proposed Federal action is not likely to result in significant impacts requiring an EIS, but the activity has not been categorically excluded from NEPA, an agency can prepare an environmental assessment (EA) to assist them in determining whether there is a need for an EIS. The Council on Environmental Quality (CEQ) has defined “major Federal action” to include activities over which Federal agencies have control. Often, agencies exercise considerable discretion when promulgating a regulation. In the case of the 2018 Farm Bill, Congress has prescribed the program changes that must be made, and there is very little discretion remaining for NRCS to exercise. Those decisions that do remain fall within categories of activities that have been previously determined to be excluded from the requirement to prepare an EIS. Despite this, NRCS has decided to prepare this programmatic EA to review the effects of activities that will occur on the ground when CSP is implemented following 2018 Farm Bill requirements. This provides a programmatic analysis to which those site-specific actions may tier, when appropriate, for purposes of complying with NEPA.

CEQ has indicated that because an EA is a concise document, the purpose of which is to determine the need for an EIS, it should not contain long descriptions or detailed data which the agency may have gathered. Rather, it should contain a brief discussion of the need for the proposal, alternatives to the proposal, the environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted. In addressing these requirements, this EA also incorporates by reference relevant analysis from the 2009 CSP Programmatic EA as well as other existing analysis.

1.1 Overview of the Conservation Stewardship Program under the 2008 and 2014 Farm Bills

NRCS, acting on behalf of the Secretary of Agriculture, is responsible for the implementation of CSP. Eligible applicants who rank sufficiently high for NRCS to approve a CSP contract, receive compensation for carrying out additional conservation activities, and for improving, maintaining and managing existing conservation activities that improve and conserve the quality and condition of natural resources.

CSP provides technical and financial assistance to producers of agricultural and forestry operations for the conservation and improvement of natural resources including soil, water, air, energy, plant, and animal life on working lands. Its purpose is to encourage agricultural producers to address priority resource concerns¹ on private and Tribal lands in a comprehensive manner by—

¹ A priority *resource concern* is a natural resource concern or problem, that is identified at the national, State, or local level as a priority for a particular area of a State; represents a significant concern in a State or region; and is likely to be addressed successfully through the implementation of conservation activities under CSP. See section 1240I.(5) of the 2018 Farm Bill.

- Undertaking additional conservation activities,² and
- Improving, maintaining, and managing existing conservation activities.

CSP was available in the 50 States, District of Columbia, Commonwealth of Puerto Rico, Guam, U.S. Virgin Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands. Agricultural and nonindustrial private forestry producers were eligible to participate in CSP if, at the time of application, they were an operator of record in the Farm Service Agency (FSA) farm records management system or would operate and have effective control of the land for the life of the proposed contract, were in compliance with Farm Bill highly erodible land and wetland conservation provisions,³ were in compliance with adjusted gross income provisions,⁴ and provided information, as required by NRCS, to determine eligibility for the program. Applicants also had to demonstrate at the time of the contract offer that they met the stewardship threshold⁵ for at least two priority resource concerns and would meet or exceed the stewardship threshold for at least one additional priority resource concern by the end of the proposed stewardship contract by—

- Installing and adopting additional conservation activities; and
- Improving, maintaining, and managing conservation activities in place at the time the contract offer is accepted.

CSP payments⁶ were provided for conservation activities conducted on private or Tribal land on which agricultural commodities, livestock, or forest-related products are produced, to include cropland, grassland, pastureland, rangeland, nonindustrial private forest land, and other agricultural land (including cropped woodland, marshes, and agricultural land used for livestock production). Conservation activities include both traditional NRCS conservation practices and enhancements. Conservation practices are specified treatments, such as a structural or vegetative practice or management technique, for which standards and specifications have been developed by NRCS. Conservation practice standards are documented in the NRCS Field Office Technical Guide (FOTG).⁷ Enhancements are based on conservation practices but are designed to exceed the minimum criteria in the associated conservation practice standard, resulting in more beneficial effects to natural resources.

NRCS has developed network effects diagrams depicting the typical direct, indirect, and cumulative effects of traditional conservation practices, as described in appendix A, and has also summarized

² *Conservation activities* are conservation systems, practices, or management measures. Conservation activities include structural, vegetative, and land management measures, including agriculture drainage management systems; planning needed to address a priority resource concern; development of a comprehensive conservation plan; soil health planning, including planning to increase soil organic matter; and activities that will assist a producer to adapt to, or mitigate against, increasing weather volatility. See section 1240I.(2) of the 2018 Farm Bill.

³ Highly erodible land and wetland *conservation provisions* are found at 7 Code of Federal Regulations (CFR) Part 12.

⁴ *Adjusted Gross Income provisions* are found at 7 CFR Part 1400.

⁵ A *stewardship threshold* is defined as the level of natural resource conservation and environmental management required, as determined by NRCS using conservation measurement tools, to conserve and improve the quality of a resource. See section 12340I.(7) of the 2018 Farm Bill.

⁶ *Payment*, as defined in the Interim Final Rule for CSP, means financial assistance provided to the participant under the terms of the CSP contract.

⁷ *FOTG* information is available at the *electronic FOTG web site*, <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>

general effects in the conservation practice physical effects (CPPE).⁸

An application must have included all eligible land on a producer's agricultural operation. Lands enrolled in the Conservation Reserve Program (except those with expiring conservation reserve contracts where conservation reserve payments would cease before the first CSP payment was made), a Wetland Reserve Easement under the Agricultural Conservation Easement Program, Conservation Security Program, and public agricultural lands owned by a Federal, State, or local unit of government were not eligible for enrollment.

1.2 Stewardship Contracts under 2008 and 2014 Farm Bills

Applications were accepted by NRCS on a continuous enrollment basis, with one or more ranking periods throughout the fiscal year. Contract offers were evaluated and ranked at the State level. Conservation treatment on all eligible land was used to determine an offer's ranking score and annual payments to the participant. Stewardship contracts were developed for those producers determined eligible and who ranked sufficiently high. Contracts included provisions stating the amount of payment to be made to the participant for each year of the contract, requirements of the participant, and other items necessary to ensure the provisions of the program were achieved. CSP contracts were for a 5-year period. NRCS and the program participant also developed a conservation stewardship plan which:

- Recorded the participant's decisions;
- Described additional conservation activities to be implemented, managed and improved; and
- Included a schedule of conservation activities to be implemented, managed or improved under the conservation stewardship contract.

Participants had to continue to operate and maintain existing conservation activities on the agricultural operation to at least the level of conservation performance identified at the time of application for the entire contract period. The participant also had to maintain all additional activities installed and adopted throughout the contract period.

Since 2009, CSP has grown to become the Nation's largest conservation program, with more than 70 million acres of working lands enrolled.

1.3 Payments and Limitations under the 2008 and 2014 Farm Bills

Under the 2008 Farm Bill, the Secretary of Agriculture was directed to enroll 12,769,000 acres nationwide for each fiscal year. The acreage limit was reduced to 10,000,000 acres each fiscal year under the 2014 Farm Bill. Each State Conservationist received annual acreage allocations, primarily based on the total acres of eligible land in the State. In addition, 10 percent of acres were set aside specifically for assistance to socially disadvantaged⁹ and beginning farmers and ranchers.¹⁰

⁸ *Conservation Practices Physical Effects (CPPE)* information can be found at https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/neps/?cid=nrcs143_026849 and in each State's electronic Field Office Technical Guide (FOTG), <https://efotg.sc.egov.usda.gov/#/>

⁹ *Socially Disadvantaged Farmer or Rancher* means a producer who has been subjected to racial or ethnic prejudices because of their identity as a member of a group without regard to their individual qualities. See 7 U.S.C. 2279.

¹⁰ *Beginning Farmer or Rancher* means an individual or entity who: (a) has not operated a farm, ranch or nonindustrial

NRCS provided CSP participants with the following types of payments: (1) annual payments for installing and adopting additional conservation activities and improving, maintaining, and managing existing activities, and (2) supplemental payments for the adoption or improvement of resource-conserving crop rotations.¹¹

NRCS did not provide payments for conservation activities for which there was no cost incurred or income forgone by the participant or for conservation practices or enhancements applied with financial assistance through other USDA programs. In addition, NRCS would not make payments for the design, construction or maintenance of animal waste storage or treatment facilities or associated waste transport or transfer devices for animal feeding operations.¹²

The 2008 and 2014 Farm Bills set a maximum national average rate of \$18 per acre. This included costs of all financial assistance, technical assistance, and any other expenses associated with enrollment or participation in the program. In addition, CSP contracts were subject to annual payment limitations and contract payment limitations, excluding funding arrangements with federally recognized Indian Tribes or Alaska Native corporations. Each stewardship contract was limited to \$40,000 per year (\$80,000 per year for contracts with joint operations) and \$200,000 over the life of the initial contract period (\$400,000 for contracts with joint operations).

1.4 Overview of CSP 2018 Farm Bill Changes

The 2018 Farm Bill moved CSP from subchapter B of chapter 2 of subtitle D of Title XII of the Food Security Act of 1985 to a new subchapter B of chapter 4 of subtitle D of Title XII of the Food Security Act of 1985, and then repealed subchapter B of chapter 2 as amended. This move reflects the intent of Congress that NRCS's administration of CSP be streamlined and aligned with the Environmental Quality Incentives Program (EQIP), including applications, contracting, conservation planning, conservation practices, and related administrative procedures. The 2018 Farm Bill made the following additional changes to CSP program requirements:

- Confirms validity of CSP contracts entered into prior to 2018 Farm Bill enactment, provides for extension of such contracts that were due to expire on or before December 31, 2019, and authorizes contract renewal of such contracts only through the new CSP authority.
- Defines new terms and adjusts existing terms, including expanding the definition of "conservation activities" and defining the term "stewardship threshold."
- Simplifies CSP ranking criteria and requires that both new contracts and contract renewals be ranked based on those criteria.
- Adds criterion that if two or more applications receive the same ranking, the applications will be ranked based on the extent to which actual and anticipated conservation benefits from each contract are provided at the lowest cost relative to other similarly beneficial offers.
- Identifies that participants may be given the opportunity to renew in the first half of the fifth year of the initial contract.
- Bases program allocations on funds rather than acres and eliminates the requirement that NRCS administer the program at \$18 per acre nationally.

private forest land, or who has operated a farm, ranch or nonindustrial private forest land for not more than 10 consecutive years, and (b) will materially and substantially participate in the operation of the farm or ranch. See 7 U.S.C.1991(a)(8).

¹¹ A *resource-conserving crop rotation* was defined in the 2008 Act as including at least one resource conserving crop, reducing erosion, improving soil fertility and tilth, interrupting pest cycles, and in applicable areas, reducing depletion of soil moisture or otherwise reducing the need for irrigation. See section 1238G(f)(4) of the 2008 Farm Bill.

¹² Activities specifically *excluded* from receiving CSP payments, were found in section 1238G(e)(3) of the 2008 Farm Bill.

- Incentivizes certain activities, by authorizing payment for cover crop activities at not less than 125 percent of the annual payment amount and authorizing a supplemental payment for advanced grazing management or resource-conserving crop rotations at not less than 150 percent of the annual payment amount.
- Provides for a one-time payment to participants who agree to develop a comprehensive conservation plan based on the number of priority resource concerns addressed and the number of types of land uses included.
- Establishes a \$200,000 payment limitation for individuals and legal entities for all contracts entered into during fiscal year (FY) 2019 through 2023, excluding funding arrangements with Indian Tribes.
- Requires that States be given an allocation to support organic production and transition to organic production based on the certified and transitioning organic operations of the State and the organic acres of the State.
- Requires that to the greatest extent practicable that the program should be managed to enhance soil health.
- Requires NRCS to submit an annual report to Congress on payment rates along with an analysis of whether payment rates can be reduced for the most expensive conservation activities.
- Authorizes a CSP-Grasslands Conservation Initiative to assist producers with certain base acres in protecting grazing land uses and waives several program requirements to facilitate the enrollment of contracts under the initiative.
- Authorizes funding for CSP at:
 - \$700 million for FY 2019
 - \$725 million for FY 2020
 - \$750 million for FY 2021
 - \$800 million for FY 2022
 - \$1 billion for FY 2023

2 PURPOSE AND NEED FOR ACTION

NRCS needs to promulgate regulations to implement CSP as required by the 2018 Farm Bill. When these changes are implemented, NRCS must ensure it does so in a manner that achieves the purpose for which CSP has been authorized.

As stated in the 2018 Farm Bill, the purpose of CSP is to encourage agricultural producers to address priority resource concerns and to improve and conserve the quality and condition of natural resources in a comprehensive manner by undertaking additional conservation activities and improving, maintaining, and managing existing conservation activities.

As the scope of the proposed action is for a national program, the analysis herein is referred to as a Programmatic Environmental Assessment (EA) and evaluates the potential environmental impacts at a broad program scale.¹³ NRCS is using this Programmatic EA to determine whether promulgation of the Interim Final Rule will significantly affect the quality of the human environment, such that NRCS

¹³ *CEQ Regulations for Implementing NEPA*, 40 CFR Part 1508.9.

must prepare an EIS.¹⁴

Actions that may be taken by NRCS at the State and local levels to further implement CSP will be able to tier¹⁵ to, or incorporate by reference, the general and broad scale analysis from this national Programmatic EA into more local-level (State, areawide, site-specific) analyses. Any subsequent analyses prepared to implement CSP at the State or local level will meet NEPA's intent by focusing on the issues and concerns pertinent to that site-specific action.

3 ALTERNATIVES AND SCOPE OF ANALYSIS

3.1 Scoping and Public Involvement

On February 26, 2019, USDA hosted a listening session at the USDA South Building in Washington, D.C., that was streamed live on <https://www.farmers.gov/manage/farmbill> for those unable to attend in person. The event gave the public an opportunity to provide input to the NRCS and other agencies on implementing changes to existing programs under the 2018 Farm Bill and to share their thoughts about how USDA can streamline and improve program delivery, as well as enhance customer service. A video of the listening session is available at <https://www.farmers.gov/manage/farmbill> and on YouTube. A notice announcing the listening session was published in the Federal Register and interested parties submitted 183 written comments through the web site <https://regulations.gov/document>. Comments specific to CSP are summarized below.

- Coordinate enrollment periods for CSP and EQIP and align planning documents.
- Begin enrollment for each program as quickly as possible to prevent further confusion from producers regarding their options for extending their CSP contracts and enrolling in new CSP contracts.
- Communicate the options available to producers for transition to CSP, EQIP, or organic production in the final years of a CRP contract.
- Maintain the distinct aspects of EQIP (address specific resource concerns with specific cost-shared practices) and CSP (comprehensive, whole-farm conservation).
- Enhance coordination between EQIP and CSP to allow a seamless graduation from the former to the latter whenever a producer meets the conservation stewardship threshold for two priority resource concerns as required for enrollment in CSP.
- Promote and implement the new EQIP Incentive Contracts as a means to help farmers meet stewardship thresholds and qualify for CSP.
- Address Western United States drought concerns to ensure that increased benefits will be afforded to western producers struggling with significant water supply challenges.
- Establish robust standards for soil health planning and incorporate soil health into ranking criteria.
- Provide adequate payment rates to incentivize cover crops, resource-conserving crop rotations, and advanced grazing management.

An interim rule with request for comment amended the CSP regulations effective November 12,

¹⁴ NRCS Regulations for Compliance with NEPA, Definitions, 7 CFR Part 650.4(b)(2), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_025525.doc.

¹⁵ Tiering refers to the coverage of general matters in broader environmental analyses (such as national programmatic documents) and subsequent narrower environmental analyses (such as regional or basin-wide program analyses or ultimately site-specific evaluations) incorporating this general discussion by reference and concentrating solely on the issues specific to that analysis. See the CEQ Regulations for Implementing NEPA, Section 1508.28, https://www.energy.gov/sites/prod/files/NEPA-40CFR1500_1508.pdf

2019. Over 600 comments were received from more than 100 individuals and agricultural and conservation organizations. Issues identified based on the most frequent comments received on the interim rule are summarized below. NRCS responded to these comments in the preamble of the final rule.

- The restriction on CSP participants only being able to renew a contract one-time; many commenters recommended that NRCS remove the "one-time only" language from the renewal option.
- The ranking criteria and process for existing participants to renew their CSP contracts; many commenters supported that renewal be based mostly or completely upon the environmental benefits of the renewal contracts, especially those benefits obtained from implementation of existing activities.
- The statutory payment limitation on persons and legal entities that does not apply to joint operations; many comments recommended eliminating the higher contract limit for joint operations.
- Payment rates, particularly the balance between how much emphasis is placed on payment for existing conservation activities versus payment for new conservation activities.
- The requirement for participants to adopt at least one additional conservation activity on a land use in order to receive an annual payment for that land use.

In the Federal Register notice announcing the interim rule, the public was also invited to submit comments on the Programmatic EA. One comment specific to the Programmatic EA was received stating that NRCS should identify and analyze a range of reasonable alternatives in addition to its proposed action (alternative 2). NRCS disagrees it is required to analyze additional alternatives. NRCS considered various ways to implement the few portions of the CSP left to its discretion. Such decisions by agency leadership fall under USDA categorical exclusions related to policy development and funding of programs and are therefore exempt from the requirement to prepare an EA or EIS. NRCS prepares its programmatic NEPA documents to provide broad-scale analyses to which site-specific program actions may tier, when appropriate, for purposes of complying with NEPA. Therefore, a single proposed action alternative and the no action alternative required by law are appropriate.

The overall impacts of CSP are beneficial to the environment and would be regardless of discretionary decisions by NRCS leadership on policy and funding disclosed in the CSP regulations. NEPA does not require Federal agencies to consider alternatives that have substantially similar consequences; rather, it is clearly intended to help agencies avoid significant adverse impacts. Conservation activities associated with each CSP contract undergo additional site-specific environmental review and analysis designed to avoid, minimize, rectify, reduce, eliminate, or compensate for any potential adverse impacts.

3.2 Alternative 1 – No Action – Continuation of CSP as Implemented under the 2008 and 2014 Farm Bills

Alternative 1, the No Action Alternative, is to continue implementing CSP as it was under the 2008 and 2014 Farm Bills. Alternative 1 is not a viable alternative because NRCS must implement CSP as authorized by Congress. Alternative 1 also will not meet the purpose and need for action. However, the No Action Alternative provides a baseline against which to compare the effect of the 2018 Farm Bill changes. CEQ NEPA implementing regulations require analysis of a No Action alternative for this purpose.

3.3 Alternative 2 – Agency Proposed Action – Implementation of 2018 CSP Requirements

Alternative 2, the Agency’s proposed action, is to implement the CSP under the Interim Final Rule developed by NRCS and according to the statutory requirements that Congress has placed on the program. Many of the statutory requirements are described in section 1.4 of this Programmatic EA. NRCS will promulgate the Interim Final Rule at the national level to ensure consistency of program implementation across the Nation. However, implementation of CSP will occur at the State and local levels, including decisions regarding selection of priority resource concerns, evaluation and ranking of contract offers, and contract development.

4 IMPACTS OF ALTERNATIVES

4.1 Scope of Analysis

The analysis that follows provides general information from a national perspective on the potential impacts on the human environment associated with the promulgation of rules to implement CSP. Due to the broad-scale nature of the analysis, many of the assessments are qualitative and are based on a review of the best available scientific studies and analyses and on professional judgments. In assessing impacts, consideration has been given to—

- Permanence of an impact.
- Potential for natural attenuation of the impact.
- Uniqueness or replaceability of the resource.
- Abundance or scarcity of the resource.
- Potential mitigation measures that can offset or reduce the anticipated impact.

For this Programmatic EA, potential environmental effects are analyzed according to soil, water, air, plants, animals, energy, and human resources (SWAPA+EH). Additionally, special environmental concerns (SECs) identified in NRCS regulations,¹⁶ environmental laws, and Executive orders are included in the SWAPA+EH analysis, as appropriate, and include—

- Prime and unique farmlands.
- Clean Water Act.
- Floodplain management.
- Wetlands.
- Wild and scenic rivers.
- Coastal Zone Management Act.
- Coral reefs.
- Clean Air Act.
- Endangered and threatened species.
- Noxious and invasive species.
- Essential fish habitat.
- Migratory birds.
- Riparian areas.

¹⁶ NRCS Regulations for Compliance with NEPA, Subpart B – *Related Environmental Concerns*, 7 CFR Part 650, https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_025525.doc

- Natural areas.
- Scenic beauty.
- Cultural resources/historic properties.
- Environmental justice.

4.2 Uncertainty in Analysis

CSP is a voluntary program, so program participation and the associated impacts cannot be guaranteed. In addition, the wide variety of agricultural operations and related environmental and social concerns across the Nation, and the CSP statutory framework, requires that NRCS implement CSP with flexibility to address differences in State, Tribal, and local situations. State Conservationists must have flexibility concerning the selection of priority resource concerns so that the program is most effective under the circumstances that exist at the State and local levels. At the same time, NRCS must maintain program integrity by ensuring a level of consistency in the way States carry out CSP responsibilities through the promulgation of national rules.

The primary factor that will influence the magnitude of the impacts resulting from Alternative 2 in each State is the selection of priority resource concerns for each watershed or other appropriate region or area within a State. These will be determined by each State Conservationist, in consultation with the State technical committee, agricultural and forestry producers, and other stakeholders. Therefore, it is unknown which resource concerns will be selected in what locations. Furthermore, evaluation and ranking of contract offers and contract development will also be done at the State and local levels. It is likely that differences between the States will cause a great deal of variability in impacts across the country and, perhaps, from year-to-year. These differences depend upon the decisions made at the State and local levels. Because CSP is “customized” to address local concerns, the impacts of program implementation on specific natural resources is impossible to predict except in a very general, broad-scale, and qualitative manner.

4.3 NRCS Use of the Environmental Evaluation

A site-specific environmental evaluation (EE) is required for all NRCS technical and financial assistance.¹⁷ The EE identifies relevant resource concerns and alternatives, evaluates potential impacts, and determines needed mitigation for soil, water, air, plant, animal, and human resources that may exist on the site. The EE also determines if there is a potential for planned conservation activities to impact protected resources. NRCS guidance on the site-specific EE process and definitions of protected resources can be found in the NRCS National Environmental Compliance Handbook (NRCS 2016).¹⁸ The EE addresses, as needed, “special environmental concerns” including the Clean Air Act; Clean Water Act; coastal zone management areas; coral reefs; cultural resources; endangered and threatened species; environmental justice; essential fish habitat; floodplain management; invasive species; migratory birds; natural areas; prime and unique farmlands; riparian areas; scenic beauty; wetlands; wild and scenic rivers; and any applicable State or local concerns, laws, ordinances, or other regulations.

In some cases, States may choose to conduct State or areawide evaluations which identify specific concerns within the area and provide an assessment which can be incorporated by reference into site-

¹⁷ *NRCS Regulations for Compliance with NEPA*, 7 CFR Part 650, https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_025525.doc

¹⁸ *National Environmental Compliance Handbook*, <https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=39893.wba>

specific EEs. For example, in consultation with the U.S. Fish and Wildlife Service, it may be determined that the conservation activities proposed under CSP to address priority resource concerns in a State do not have the potential to impact listed species, thereby eliminating the need to conduct in-depth, site-specific evaluations of potential impacts to these species for each CSP contract. Similarly, a State or areawide assessment might identify a specific concern that, if present, could be adversely impacted by a proposed conservation activity and therefore, must be further assessed during any site-specific evaluation.

Accordingly, the presence or absence of any specific concerns and potential impacts of program implementation are then evaluated through the onsite EE process. Site-specific analyses will not be subject to the uncertainties described in section 4.2, will provide an opportunity for NRCS planners to identify and mitigate any potential adverse impacts that may be associated with the proposed activities in accordance with NRCS policy,¹⁹ and will meet the intent of NEPA by focusing on the issues/concerns pertinent to that site-specific action.

4.4 General Overview of the Affected Environment

The contiguous 48 States, Hawaii, Puerto Rico, and the U.S. Virgin Islands cover over 1.94 billion acres of land and water; about 71 percent of this area is non-Federal rural land—nearly 1.4 billion acres. In 2015, the major non-Federal rural land uses were rangeland at 404 million acres (21 percent of U.S. total); forest land at 416 million (21 percent); and cropland at 367 million acres (19 percent). Figure 1 depicts these land uses, for the entire United States and the 48 contiguous States, based on the 2015 National Resources Inventory Summary Report.²⁰ The National Resources Inventory (NRI) program collects information on the status, condition, and trends of land, soil, water, and related resources on the Nation’s non-Federal lands. The NRI sample is a stratified area sample of 49 States (excludes Alaska), Puerto Rico, and the Virgin Islands. Detailed data on soil properties and land use are collected at a random sample of points. The resulting database is a longitudinal data set containing variables from 1982, 1987, 1992, 1997, and annually from 2000 through 2015.

NRI data show cropland acreage increased by about 4.6 million acres from 2012 to 2015. It had steadily declined between 1982 until 2007, when it began increasing every year. Most of the gain (78%) came from land coming out of the Conservation Reserve Program with some cropland converted to pasture, counterbalanced to some degree by losses of cropland to development and other rural land.²¹

About 43 million acres of land was newly developed between 1982 and 2015, bringing the total to about 115 million acres; a 60-percent increase. However, as the population has increased, the acres developed per person has dropped off. Most land for development (about 18.8 million acres) was converted from forest land. Cropland converted to development totaled about 11.1 million acres while about 5.9 million acres of rangeland was developed.

Figure 1: Surface Area by Land Cover/Use, 2015 (source: Summary Report: 2015 National

¹⁹ See *NRCS Environmental Policy* located in the NRCS General Manual at Title 190, Subpart A, Part 410.3, <https://directives.sc.egov.usda.gov/viewerFS.aspx?id=666>

²⁰ U.S. Department of Agriculture. 2018. Summary Report: 2015 National Resources Inventory, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. <http://www.nrcs.usda.gov/technical/nri/15summary>

²¹ *ibid*

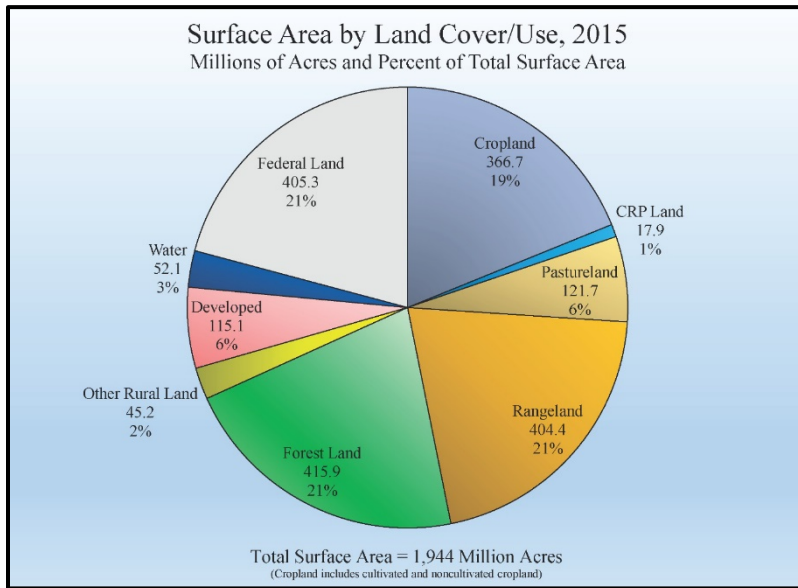
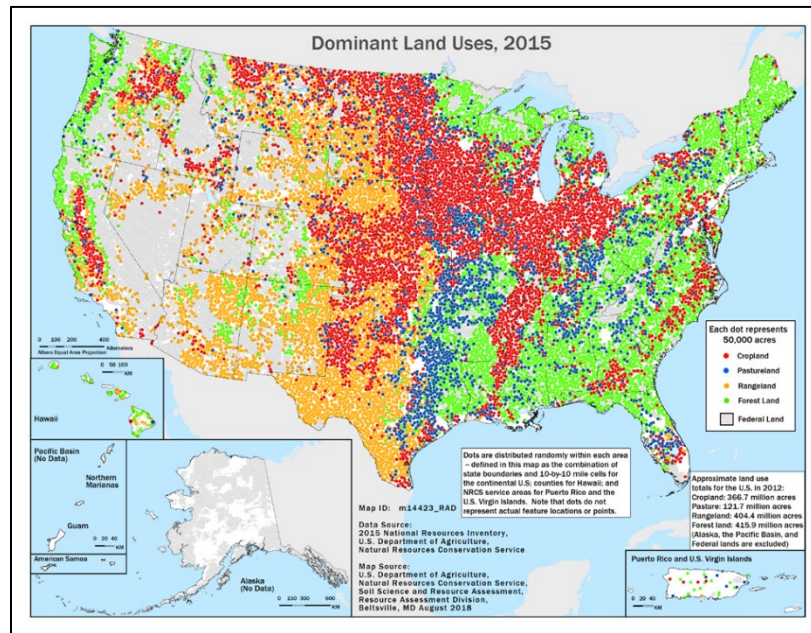


Figure 2 depicts the distribution of the four primary rural land types (forest, rangeland, cropland, and pasture) across the 48 contiguous States, Hawaii, and the Caribbean territories.

Figure 2: Dominant Land Uses, 2015 (source: Summary Report: 2015 National Resources Inventory, http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1422028.pdf)



Agricultural and forestry operations can have impacts, both beneficial and adverse, on natural resources and resource concerns including soil, water, air, plants, animals, humans, and energy. For more specific characterizations and baseline information on each of these resources, see section 3.2 of the January 2009 EQIP Programmatic EA,²² which is incorporated herein by reference.

As of September 2018, over 72 million acres had been enrolled in active and completed CSP contracts. Maps showing the general distribution of CSP acres and contracts under the 2008 and 2014 Farm Bill can be viewed at

https://www.nrcs.usda.gov/Internet/NRCS_RCA/maps/cp_cstp_maps.html.

Historically, NRCS has addressed soil, water, air, plant, animal, and energy resource concerns using conservation practices and systems of practices within the nine-step NRCS conservation planning process. The NRCS National Handbook of Conservation Practices²³ contains national standards for each conservation practice. These standards are included in the handbook only after the public has had the opportunity to comment on them.²⁴ State technical staffs then localize the standards to fit conditions in each State and establish quality and quantity requirements (specifications) for applying each conservation practice. Standards for conservation practices are detailed in section IV of the local

²² January 2009 EQIP Programmatic EA, https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcs143_006910&ext=pdf

²³ For additional information on the *National Handbook of Conservation Practices* (450-NHCP-Amend. 16, September 2015) and individual conservation practices, see <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/nrcps/>

²⁴ For a description of how NRCS develops its *conservation practice standards*, see NRCS General Manual Title 450, Part 401, Subpart B, at the NRCS Electronic Directives System web site, <https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=19430>

FOTG.²⁵ Conservation practice standards, planning criteria,²⁶ and local resource data are maintained in the FOTG to provide detailed information for planners to plan and design practices in a manner consistent with local conditions and resource concerns. Commonly, suites of conservation practices are planned and installed together as part of a conservation management system designed to enhance soil, water, and related natural resources for sustainable use. Conservation practice standards and State-specific conservation practice specifications include considerations that ensure the minimization of potentially adverse impacts to associated resources. NRCS has developed network effects diagrams that depict typical impacts of conservation practices. These diagrams are discussed in detail in appendix A.

When CSP was first authorized by Congress in the 2008 Farm Bill, it substantially changed how USDA provided conservation planning assistance and payments for the program. Most of the producers approved for CSP contracts were already implementing conservation practices on their land and agreed to adopt additional conservation activities to further improve their conservation performance. For example, if a rancher had been practicing prescribed grazing, CSP would provide options to enhance that practice with activities such as grazing management to improve plants for wildlife, or grazing management to reduce soil compaction, or grazing management to improve riparian function.

Between 2008 and 2016, CSP participants received an annual land use payment for the operation-level environmental benefits they produce. Participants were paid for conservation performance—the higher the operational performance, the higher the payment. NRCS assessed operational performance using a conservation measurement tool (CMT) that evaluated existing conservation activities participants were already using and the new activities the participant agreed to adopt in the CSP contract against NRCS planning criteria. The CMT was developed in 2009 to support the statutory requirements of the 2008 Farm Bill. The 2014 Farm Bill removed all references to the CMT. NRCS received comments during 2014 Farm Bill listening sessions that the CMT and other aspects of CSP were too complicated and not transparent. Because of these things, NRCS changed the way CSP applications were evaluated and payment amounts determined. The changes were implemented starting in FY 2017.

Since 2017, CSP provides annual payments for existing conservation activities already in use by the producer based on the number of resource concerns meeting NRCS planning criteria at the time a producer enrolls in the program and the number of acres in each enrolled land use. Payments for new activities are paid according to NRCS payment schedules. For State payment schedules go to <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/?cid=nrcseprd1328426>. The payment for new activities is based on current costs for material and labor within each State and fair marketplace compensation for opportunity costs that may arise (e.g., conversion of productive land to wildlife habitat). The payment schedules are reevaluated each year and the amount of payments adjusted if needed to reflect actual costs.

²⁵ Local FOTG information is available at the *electronic FOTG web site*, <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>

²⁶ NRCS *planning criteria* are quantitative or qualitative statement of a treatment level required to achieve a minimum level of treatment for a given resource concern for a particular land area; established in accordance with local, State, Tribal, territorial, and Federal programs and regulations in consideration of ecological, economic, and social effects; and are found in section III of each State's electronic FOTG, <https://efotg.sc.egov.usda.gov/#/>

4.4.1 Soil Resource Concerns

Estimated water (sheet and rill) erosion on cropland in 2015 was 990 million tons per year, and erosion due to wind was 700 million tons per year.²⁷ Soil erosion can occur on any land where soil is exposed and therefore, susceptible to erosion due to climatic factors, soil characteristics, landscape features, and cropping practices. However, soil erosion rates on cropland have decreased 34 percent between 1982 and 2015. The water (sheet and rill) erosion rate declined from 3.82 tons per acre per year to 2.71 tons per acre per year, and the erosion rate due to wind decreased from 3.21 tons per acre per year to 1.91 tons per acre per year. Erosion also occurs from the concentrated flow of water, in ephemeral and classic gullies.

Conservation practices that have traditionally been used to reduce soil erosion are summarized in appendix B. Activities to reduce soil erosion generally involve covering the soil with live vegetation, crop residues, or other materials to prevent soil detachment; creating barriers to wind or water to reduce detachment and transport; creating channels or other barriers to redirect and slow water runoff; and creating detention areas to promote sedimentation.

Soil quality describes how well soil functions to sustain biological productivity, regulate and partition soil water and solutes, filter and buffer organic and inorganic materials, store and cycle nutrients and carbon, and provide stability and support for plants or structures for human habitation (modified from Seybold et al. 1998).²⁸ Soil quality is evaluated using inherent and dynamic soil properties.

Inherent soil properties are generally not affected by human management and include soil texture, depth to bedrock, clay type, cation exchange capacity, and drainage class. In contrast, dynamic soil properties can change over months to years in response to management and land use. Dynamic soil properties include organic matter, soil structure, infiltration, and water- and nutrient-holding capacity.

Soil organic matter is a dynamic property of particular interest due to soils' ability to "sequester" carbon. Model simulations²⁹ have estimated that an average of 58 tons of soil organic carbon is present per cropland acre. Soil organic carbon levels vary considerably among cropland acres, both by region and by crop within regions. Simulations found the upper Midwest region to have the highest soil organic carbon, averaging 71 tons per cropland acre. The lowest levels, 43 and 44 tons per acre, were in the southern Great Plains and south-central regions respectively. Legume hay consistently had the highest soil organic carbon levels in every region, while cotton and peanuts had the lowest soil organic carbon levels in regions where those crops are grown.

Soils covered by permanent vegetation in forests, pastures, and rangelands can also provide long-term carbon storage. The National Resource Ecology Lab at Colorado State University has estimated that private grassland and shrubland soils in the United States gained 1.6 million metric tons per year in the 1990s (Negra et al. 2008).³⁰

²⁷ Summary Report: 2015 National Resources Inventory, https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1422028.pdf

²⁸ Seybold, C.A., M.J. Mausbach, D.L. Karlen, and H.H. Rogers. 1998. Quantification of soil quality. In *Soil Processes and the Carbon Cycle*. R. Lal, J.M. Kimble, R.F. Follett, and B.A. Stewart, eds. CRC Press, Boca Raton, FL.

²⁹ Potter, Steven R., et al. 2006. Model Simulation of Soil Loss, Nutrient Loss, and Change in Soil Organic Carbon Associated with Crop Production. USDA-NRCS Conservation Effects Assessment Project (CEAP). https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/ceap/na/?cid=nrcs143_014128

³⁰ Negra, Christine, et al. 2008. Indicators of Carbon Storage in U.S. Ecosystems: Baseline for Terrestrial Carbon Accounting. *Journal of Environmental Quality* 37:1374–82.

Dynamic soil properties, including carbon, are influenced by the type, diversity, and amount of vegetative cover, which is in turn influenced by agricultural and forestry management. Soil disturbance impacts soil dynamic properties. For example, tillage accelerates decomposition of organic matter and prevents its accumulation, thereby reducing soil stability and soil quality and increasing soil susceptibility to water and wind erosion. The use of high-residue crops, cover crops, and crop rotations on cropland; management to maintain recommended minimum forage heights on grazing lands; and the application of best management practices on forest lands generally improve soil condition by providing protective soil cover and organic matter. Specific conservation practices that have traditionally been used to improve soil condition resource concerns such as organic matter depletion, compaction, and contaminants are summarized in appendix B.

4.4.2 Water Resource Concerns

Disturbance of soil cover and of the soil itself can produce wind- and water-induced soil erosion and associated sedimentation. Agriculture operations apply inorganic and organic fertilizers, primarily nitrogen, phosphorus, and potassium to promote plant growth. Herbicides, insecticides, and fungicides are also applied to control pests that may reduce plant and animal growth and productivity. Offsite movement of soil, nutrients, and pesticides into surface and ground waters can degrade water quality. Some contaminants are adsorbed to soil particles (e.g., phosphate), so are typically transported with eroded sediments. Other contaminants are more soluble and typically transported in runoff waters and through infiltration (e.g., nitrate).

Sampling by the U.S. Geological Survey (USGS) (2008)³¹ for the National Water Quality Assessment Program (NAWQA) during the period 1991 to 2002, found 13 percent of streams draining agricultural lands and just over 20 percent of ground water wells sampled in agricultural landscapes to have nitrate concentrations exceeding Federal drinking water standards (10 parts per million). However, only 2 percent of samples from grasslands and shrublands exceeded the standards. Nitrate concentrations in all forested sites that were sampled were less than 6 parts per million in both ground and surface waters. One hundred percent of streams sampled for NAWQA were found to have detectable levels of pesticides, with more than 85 percent of the streams sampled having five or more pesticides detected. Of these streams, 13 percent had pesticide levels exceeding human health benchmarks for at least one pesticide. When compared to aquatic life benchmarks, approximately 57 percent of streams in agricultural watersheds were found to have one or more pesticides that exceeded benchmarks.

A new USGS study³² identified trends between 1992 and 2012 in concentrations of nutrients, sulfate, and salinity at 633 river and stream sites in the conterminous United States and related them to land use in the context of water-treatment practices and regulatory actions. The study found significant decrease in concentrations of nitrogen and phosphorus in urban streams and attributed the cause to upgrades to urban wastewater treatment systems. Changes in nitrogen concentrations in agricultural areas were small and inconsistent however, and in agricultural areas more sites had increases in phosphorus concentration than decreases. These results suggest that efforts to reduce nutrients in agricultural areas have not been fully successful but it remains unknown whether agricultural nutrient

³¹ Wilson, J.T., et al. 2008. Methods and sources of data used to develop selected water-quality indicators for streams and ground water for the 2007 edition of *The State of the Nation's Ecosystems* report with comparisons to the 2002 edition: U.S. Geological Survey Open-File Report 2008-1110. 61 p., plus 1 oversized table and 25 appendices.

³² Landscape drivers of dynamic change in water quality of U.S. rivers. Stets, E.G., Sprague, L.A., Oelsner, G.P., Johnson, H.M., Murphy, J.C., Ryberg, K., Vecchia, A.V., Zuellig, R.E., Falcone, J.A., and Riskin, M.L. Environmental Science and Technology, <https://dx.doi.org/10.1021/acs.est.9b05344>.

reductions have not been large enough or widespread enough to result in downward trends or whether past application of nutrients is causing significant lags in the response of surface waters to improved management. Ammonium did decrease broadly across all land uses. Ammonium can be highly toxic to aquatic organisms and is associated with wastewater, manure from livestock operations, and atmospheric deposition. The broad reduction in ammonium concentrations indicate that efforts to reduce these sources of ammonium have largely been successful.

A striking trend in the dataset was the substantial increase in salinity—measured as specific conductance—in streams in urban and agricultural areas, and areas with a mix of the two. Elevated salinity levels are linked to loss of stream biodiversity and can cause metals to be released from streambed sediments and water-distribution facilities and plumbing.

The 2008 USGS study also detected one or more pesticides in 61 percent of ground water wells sampled, but only 1.3 percent exceeded human health benchmarks. Table 1 contains a comparison of results from the 2008 NAWQA study for stream and ground water samples in agricultural landscapes.

Table 1: Comparison of Results from Stream and Ground Water Samples Collected for NAWQA in Agricultural Landscapes During the Period 1991 to 2002 (from Wilson et al. 2008)

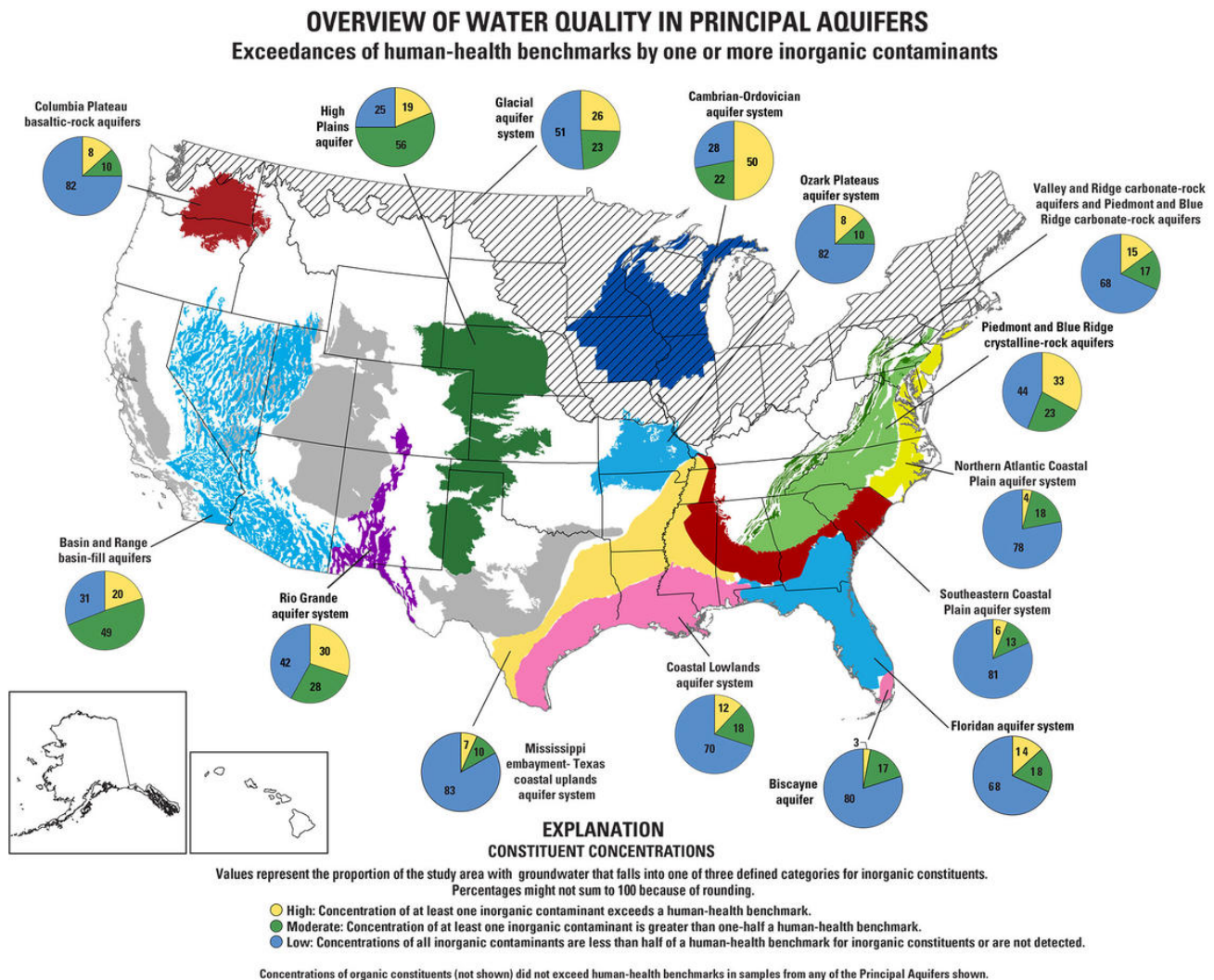
Contaminant	Nitrate	Pesticides					
		Detected	Detected	Human health ⁽¹⁾	Human health	Aquatic health ⁽¹⁾	Aquatic health
Level	> 10	Detected	Detected	Human health ⁽¹⁾	Human health	Aquatic health ⁽¹⁾	Aquatic health
	ppm	1 or more	5 or more	1 or more	2 to 3	1 or more	4 or more
Streams (%)	13	100	85	13	4	57	12
Ground water (%)	20	61	10	1.3	0	n/a	n/a

⁽¹⁾ Note: “Human health” and “Aquatic health” refer to the exceedance of established benchmark criteria.

A more recent USGS study of ground water quality includes information for 15 of the most heavily used aquifers in the Nation.³³ The study focused on ground water used for drinking, sampling nearly 1,100 public supply wells and analyzing the samples for hundreds of water quality constituents related to human health. Nitrate was the only constituent from manmade sources that exceeded human-health standards, typically in a low percentage of samples (1 or 2 percent). Nitrate comes from animal and human organic wastes as well as nitrogen-containing inorganic fertilizers. The exceedances occurred in the Floridan aquifer system, the Glacial aquifer system, the Rio Grande aquifer system, and the Valley and Ridge and Piedmont and Blue Ridge carbonate-rock aquifers as shown in figure 5 below.

³³ Musgrove, M. 2020. The Quality of Our Groundwater—Progress on a National Survey. USGS, Texas Water Science Center. https://www.usgs.gov/center-news/quality-our-groundwater-progress-a-national-survey?qt-news_science_products=1#qt-news_science_products

Figure 5: Overview of Water Quality in Principal Aquifers



Pathogens and pharmaceuticals from livestock operations are emerging water quality issues. With an increasing trend in the size and concentration of livestock operations, concerns about potential water quality issues from these sources have also increased. Pathogens and other contaminants from livestock may reach surface waters through both point and nonpoint pathways. In some cases, contamination of ground waters may occur as well.

Conservation activities on agricultural and forested land improve water quality by—

- Reducing erosion and associated transport of sediment-born contaminants (e.g., establishing a resource conserving crop rotation to reduce water erosion).
- Controlling or redirecting surface water runoff and associated soluble contaminants and pathogens (e.g., managing livestock access to streams, ditches, and other waterbodies to reduce pathogens in surface water).
- Providing vegetation to filter contaminants and pathogens from runoff (e.g., extending existing filter strips or other buffers).
- Changing management to apply nutrients and pesticides at appropriate agronomic rates

only when needed (e.g., improving nutrient uptake efficiency and reducing risk of nutrient losses to surface water).

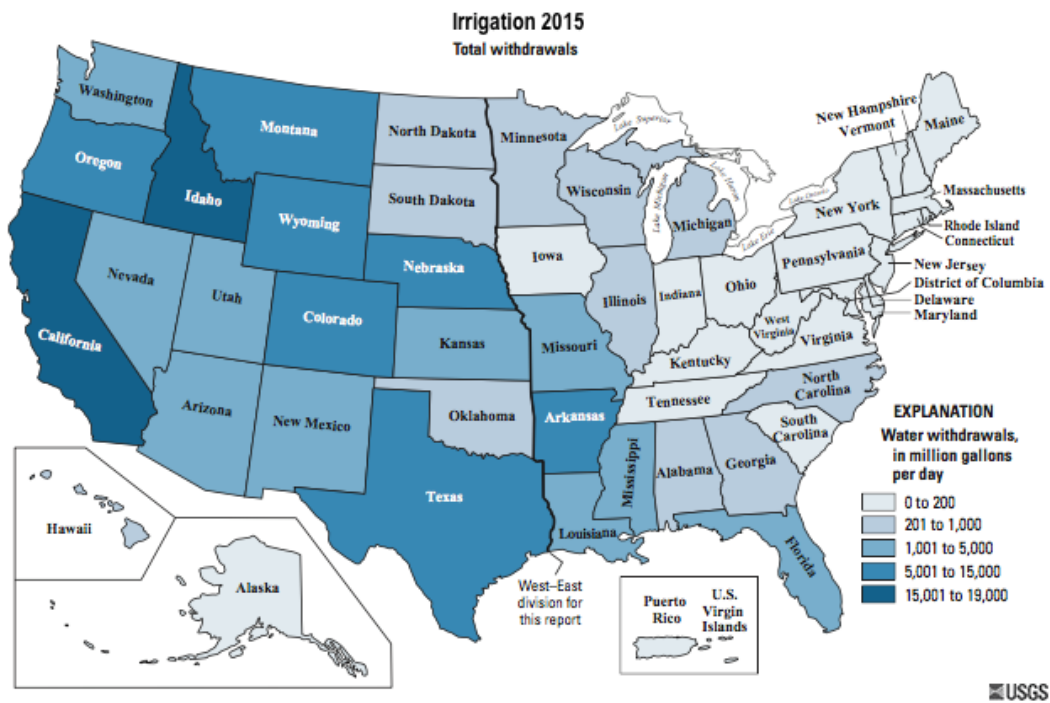
Specific conservation practices that have traditionally been used to improve water quality concerns are summarized in appendix B. Management of manure and mortality on livestock operations can also be used to improve water quality.

Water use in the United States in 2015 was estimated to be about 322 billion gallons per day (Bgal/d), which was 9 percent less than in 2010 (Dieter et al. 2018).³⁴ The 2015 estimates put total withdrawals at the lowest level since before 1970, following the same overall trend of decreasing total withdrawals observed from 2005 to 2010. Agricultural uses of water include irrigation, livestock, and aquaculture.

Surface water withdrawals (60.9 Bgal/d) accounted for 52 percent of the total irrigation withdrawals, about 8 percent less than in 2010. Ground water withdrawals for irrigation were 57.2 Bgal/d in 2015, about 16 percent more than in 2010. About 63.5 million acres were irrigated in 2015, an increase from 2010 of about 1,130 thousand acres (2 percent). The number of acres irrigated using sprinkler and microirrigation systems accounted for 63 percent of the total irrigated lands in 2015. Eighty-one percent of total U.S. irrigation withdrawals were in the 17 conterminous Western States (west of the solid line in fig. 6.)

³⁴ Dieter, C.A., Maupin, M.A., Caldwell, R.R., Harris, M.A., Ivahnenko, T.I., Lovelace, J.K., Barber, N.L., and Linsey, K.S., 2018, Estimated use of water in the United States in 2015: U.S. Geological Survey Circular 1441, 65 p., <https://doi.org/10.3133/cir1441>. Irrigation withdrawals were 118 Bgal/d in 2015, an increase of 2 percent from 2010 (116 Bgal/d) but were approximately equal to withdrawals estimated in the 1960s. Irrigation withdrawals accounted for 42 percent of total freshwater withdrawals for all uses and 64 percent of total freshwater withdrawals for all uses excluding thermoelectric power. Aquaculture withdrawals accounted for 2 percent of the total withdrawals and livestock about one percent of total freshwater withdrawals in 2015.

Figure 6: 2015 Irrigation Withdrawals by Source and State (from Dieter et al. 2018, see <https://pubs.er.usgs.gov/publication/cir1441>)



Excessive water can also be a resource concern. Ponding, flooding, seasonal high-water tables, and seeps, resulting from surface water or poor subsurface drainage restricts land use and management goals. Wind-blown snow can accumulate around and over surface structures restricting access to humans and animals.

Conservation activities are used to address excessive water by removing, redirecting, or retaining this water to improve plant productivity. On irrigated land, a variety of activities are available to improve the efficiency of water application (e.g., automated intermittent flood irrigation of rice fields), reduce evaporation (e.g., establishing a no-till system to increase plant-available moisture), and to maximize use of available water supply (e.g., advanced automated irrigation water management using soil moisture or water level monitoring).

Specific conservation practices that have traditionally been used to address water quantity concerns including insufficient supply, excessive quantities, and inefficient use are summarized in appendix B.

4.4.3 Air Resource Concerns

Air quality impacts resulting from agricultural and forestry operations tend to involve four types of emissions: particulate matter (PM) and PM precursors, ozone (O₃) precursors, greenhouse gases (GHG), and objectionable odors. Conservation practices that have traditionally been used to address these air quality issues are summarized in appendix B, and specific examples are provided below.

Agricultural operations can contribute to PM and ozone concentrations through emissions of direct PM, volatile organic compounds (VOC), oxides of nitrogen (NO_x), and ammonia. All biological organisms emit VOC, and VOC are also emitted during the breakdown or combustion of biological materials. NO_x is generally associated with combustion including farm vehicle, tractor, and irrigation engines, and with agricultural and forestry burning. PM may be either emitted directly (e.g., as dust or

smoke) or formed in the atmosphere from other pollutants, such as ammonia from animal operations or fertilizer applications. Conservation activities that may be used to reduce PM generation include establishing a no-till system to reduce tillage-induced particulate matter, modifying tillage or harvest operations to reduce particulates by at least 20 percent below required levels, and enhancing existing field borders to a width of at least 40 feet and establishing a mixture of species along the edges of fields. Activities that reduce the production of ozone-utilizing integrated pest management (IPM) include prevention, avoidance, monitoring, and suppression (PAMS) techniques to reduce ozone precursor emissions related to pesticides.

GHG emissions are a global concern. While agricultural emissions of GHGs are minor compared to other sectors such as industry, transportation, and electric generation, agriculture is also both a source and an important means of reducing GHGs. Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are the primary GHG of concern from agricultural operations. However, agriculture and forestry are also an important means of reducing GHG through soil and biomass carbon sequestration. Anthropogenic sources of CO₂ in agriculture are combustion processes and soil tillage. N₂O is emitted from nitrogen conversion processes in the soil and manure piles, while methane is primarily from animal production and manure storage. Planting tree species, managing livestock grazing for higher plant growth to increase the rate of carbon sequestration (capture), and managing nutrient applications are some activities used to address GHG emissions.

Another air quality issue related to agriculture is odor. The main classes of odorous compounds produced by agricultural sources are VOCs, odorous sulfur compounds, and ammonia. Agricultural odors typically arise from animal operations, manure management, and land application of manure. Conservation activities such as feed management, nutrient management, manure management, and lagoon covers can reduce the production and emission of odorous compounds.

4.4.4 Plant Resource Concerns

Plants provide food, fiber, and energy for people and livestock; and food, cover, and shelter for wildlife. A main objective of agricultural or forestry operations is to grow healthy, productive plants. Depending on the land use, this may involve planting annual crops, planting or managing native or introduced vegetation, or some combination of these. Healthy plant communities on rangeland, native and naturalized pastures, and forest lands protect and improve soil quality, reduce soil erosion, improve water quality, provide forage for livestock and wildlife, provide habitat for wildlife, provide fiber and energy, and sequester carbon.

Where vegetation has been planted on agricultural lands, historically stands of monocultural, even aged and often introduced grasses and trees have predominated. During recent years, efforts have been undertaken to reintroduce diverse vegetative communities of native species. The emphasis on longleaf pine (*Pinus palustris*) and reestablishment of longleaf pine ecosystems in the Southeast under CRP is one example. Eradication of saltcedar (*Tamarix ramosissima*) with reintroduction of native willows and cottonwoods in southwestern riparian ecosystems, and restoration of sagebrush ecosystems through removal of invasive western juniper (*Juniperus occidentalis*) is occurring as well.

NRCS has encouraged and facilitated this process through the development of ecological site descriptions that describe how disturbance affects a specific native plant community and help planners and landowners to understand the processes that may be needed to restore the historic native plant community.

Noxious and invasive plant and animal species, and a host of introduced diseases, are a growing

concern across the Nation. Once a nonnative, invasive species has been introduced, monitoring and control can be a monumental task. Invasive plants may crowd out native plants, make areas more susceptible to catastrophic fire, degrade habitat for native wildlife, and may harm economic, environmental, and human health. Noxious, invasive species reduce productivity (e.g., gypsy moth), and may even threaten the continued existence of native species and, ultimately, change the historic vegetative composition of entire ecosystems (e.g., chestnut blight and more recently redbay ambrosia beetle). The economic impact of these species on the United States economy is estimated in the billions of dollars,³⁵ and agricultural, forest, and other private landowners spend millions of dollars for control of noxious and invasive species each year.

Over 13,000 species of native plants are considered to be “at risk” in the United States.³⁶ Of these, 943 plant species are currently listed as threatened or endangered (table 2). The distribution of at-risk plant and animal species across the United States is shown in figure 6. The major risks to plants include many of the same factors that result in declining animal population such as destruction or alteration of habitat, spread of invasive species, emergence of lethal disease, and changes in climate.³⁷

Conservation activities address plant natural resource concerns by removing and replacing invasive plants, changing management, and otherwise maintaining and improving habitat. On pasture and range lands, activities may involve improving the availability of forage and management of livestock, controlling or managing access, controlling noxious and invasive species, enhancing wildlife food and cover, and enhancing plant biodiversity. On forest land, activities often involve planting and/or managing trees and shrubs to promote productivity, health and vigor; improving wildlife food and cover; controlling noxious and invasive species; and enhancing plant biodiversity. Specific conservation practices that have traditionally been used to address plant natural resource concerns are summarized in appendix B.

4.4.5 Animal Resource Concerns

Working lands provide important habitat for many aquatic and terrestrial wildlife species. Like all animals, fish and wildlife need food, water, and cover/shelter/structure. Connectivity of habitats, space, and balance among populations are important, and fish also need appropriate water quality. When people use the land, whether it is for agriculture, forestry, industry, or urban and suburban development, they change the quantity and quality of the wildlife habitat. As a result, the types and numbers of wildlife that can live on the land and in the associated waters change as well.

Currently, 718 species of animals in the United States are listed as threatened or endangered by the U.S. Fish and Wildlife Service (table 2). Approximately one-third of wildlife species have been designated by the individual States as being “at risk” or “species of concern.” The geographic distribution of these species in the United States is shown in figure 6. The percentage of native at-risk wildlife is higher in fresh waters (37 percent) than in forests (19 percent) or grasslands and

³⁵ Westbrooks, R.G. 1998. Invasive Plants: Changing the Landscape of America. Fact book produced by the Federal Interagency Committee for the Management of Noxious and Exotic Weeds. Washington, D.C. 107 pp.

³⁶ For more information on *at-risk species*, see NatureServe, 2018, <https://www.natureserve.org/about-us/annual-reports/natureserves-2018-annual-report/>.

³⁷ Steni, B.A. and K. Graver, 2008. Hidden in Plain Sight: The Role of Plants in State Wildlife Action Plans. NatureServe, <https://www.natureserve.org/biodiversity-science/publications/hidden-plain-sight-role-plants-state-wildlife-action-plans>

shrublands (18 percent) (Heinz Center 2008).³⁸ Declines in migratory bird species in particular have been documented around the world.³⁹ These declines may be due to a number of factors, including habitat conversion and fragmentation, changes in land management and use, herbicide and pesticide use, and threats to wintering and migratory habitats. Many of these same factors impact other wildlife species as well.

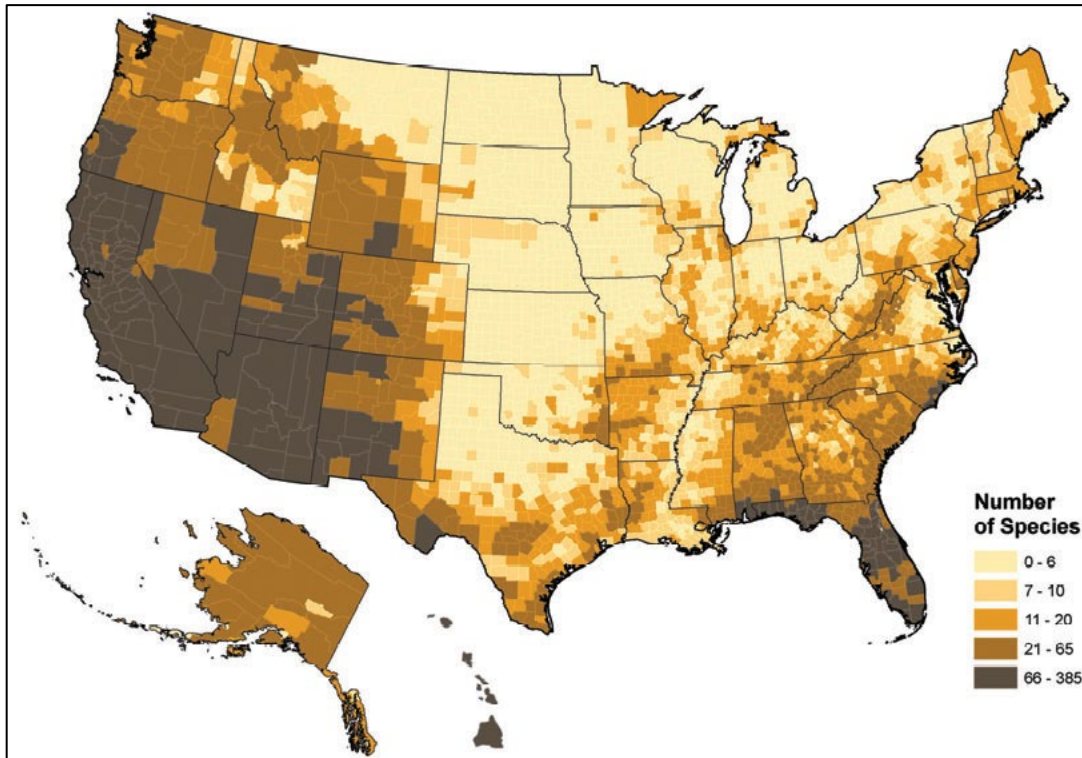
Table 2: Numbers of Animals and Plants Listed as Threatened or Endangered in the U.S. (from U.S. Fish and Wildlife Service <https://ecos.fws.gov/ecp0/reports/box-score-report>, as of Thursday, 05 Mar 2020, 19:13:02 GMT)

Group	Endangered	Threatened	Total Listings
Amphibians	21	15	36
Arachnids	12	0	12
Birds	77	22	99
Clams	76	15	91
Corals	0	7	7
Crustaceans	24	4	28
Fishes	94	73	167
Insects	74	13	87
Mammals	66	28	94
Reptiles	16	29	45
Snails	40	12	52
Animal Totals	500	218	718
Plant Totals	772	171	943

³⁸ H. John Heinz III Center for Science Economics and the Environment. 2008. The State of the Nation’s Ecosystems: Focus on Wildlife. Washington, D.C.

³⁹ For information and examples related to the *decline of migratory bird species*, see <https://www.scientificamerican.com/article/silent-skies-billions-of-north-american-birds-have-vanished/>, and U.S. Fish & Wildlife Service Migratory Bird Program, <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

Figure 7: Geographic Distribution (by County) of At-Risk Species (from Flather, et. al 2013)⁴⁰



Pollinators are another important subset of terrestrial wildlife critical to the reproduction of many plant species upon which humans and wildlife depend. Native bees, which number more than 4,000 species in North America, are thought to be declining in number due to habitat loss, pesticide use, and disease among other factors.⁴¹

Conservation activities can address fish and wildlife natural resource concerns by changing food availability; improving water availability and quality; and protecting, improving, or manipulating habitat to benefit specific species. Many activities involve the establishment or management of vegetation, although a few involve structural measures such as fence modifications. Specific conservation practices that have traditionally been used to address fish and wildlife natural resource concerns are summarized in appendix B.

Resource concerns associated with livestock include feed and forage imbalance, inadequate shelter, and inadequate quantity or quality of water. In order to reduce stress and mortality and maximize productivity, livestock producers must provide adequate food, water, and cover. They also must handle overall health care, reproduction, and manure management.

Conservation activities are used to address livestock resource concerns by: (1) managing forage production through manipulation of the intensity, frequency, duration, distribution, and season of grazing; (2) incorporating native grasses and legumes into the forage base; (3) improving livestock

⁴⁰ Flather, Curtis H.; Knowles, Michael S.; Jones, Martin F.; Schilli, Carol. 2013. Wildlife population and harvest trends in the United States: A technical document supporting the Forest Service 2010 RPA Assessment. Gen. Tech. Rep. RMRS-GTR-296. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 94 p.

⁴¹ For more information, see the Xerces Society, <http://www.xerces.org/pollinator-conservation/>.

shelter and water supplies and systems; and (4) managing livestock manure. Because the presence and management of livestock may impact natural resources such as soil and water quality, consideration of the impacts of livestock and any planned management upon these resources must be considered. Specific conservation practices that have traditionally been used to address livestock resource concerns are summarized in appendix B.

4.4.6 Energy Resource Concerns

Energy-related costs are a significant agricultural operating expense. On-farm energy conservation saves money for the farmer, reduces overall national energy consumption, and reduces air pollution and GHG emissions. In some cases, on-farm energy generation is possible through the production of biogas and capture of wind, solar, and geothermal energy. Agriculture and forestry can also be sources of biomass for renewable energy generation.

Conservation activities to address energy concerns include those that increase efficiency, for example, by reducing the number of trips made by a tractor across a field or the amount of irrigation water that must be pumped. Other activities may assist producers in collecting, storing, and utilizing biogas produced on the farm or generating other forms of renewable energy. Specific conservation practices that have traditionally been used to conserve energy are shown in appendix B.

4.4.7 Socioeconomic Considerations

The conservation planning process includes consideration of economic, social, and cultural resource factors. Some of the economic aspects that are addressed in formulating and evaluating conservation plans include: cost effectiveness, financial condition, markets, levels of inputs and management required, base acreage, USDA program eligibility, and sustainability. Social considerations include public health and safety, values, client characteristics, risk tolerance/aversion, and tenure. Cultural considerations include absence or presence of cultural resources, significance of cultural resources, effects of conservation activities on cultural resources, and any necessary mitigation of adverse effects.

Agricultural and forest lands provide income for operators and landowners. In turn, local economies benefit from the income and operating expenses that flow through the community. Communities are also impacted by offsite effects of agricultural operations on natural resources such as soil, water, and air and social values such as scenic beauty.

NRCS conducts outreach to help historically underserved groups participate in conservation programs.⁴² These groups include socially disadvantaged and beginning farmers and ranchers. In the “2017 Census of Agriculture,” socially disadvantaged farmers and ranchers were found to number 204,510 or 10 percent of all farmers in the United States, while 597,377 (29.3 percent) were listed as being on their present farm or ranch for less than 10 years, (i.e., beginning farmers and ranchers.)⁴³ Figures 8 and 9 illustrate the general locations of socially disadvantaged and beginning farmers across the United States.

⁴² See Section 2708 of the 2008 Farm Bill for information on incentives for *historically underserved groups*.

⁴³ 2017 Census of Agriculture,

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Race,_Ethnicity_and_Gender_Profiles/cpd99000.pdf

Figure 8: Geographic Distribution of Socially Disadvantaged Farmers and Ranchers

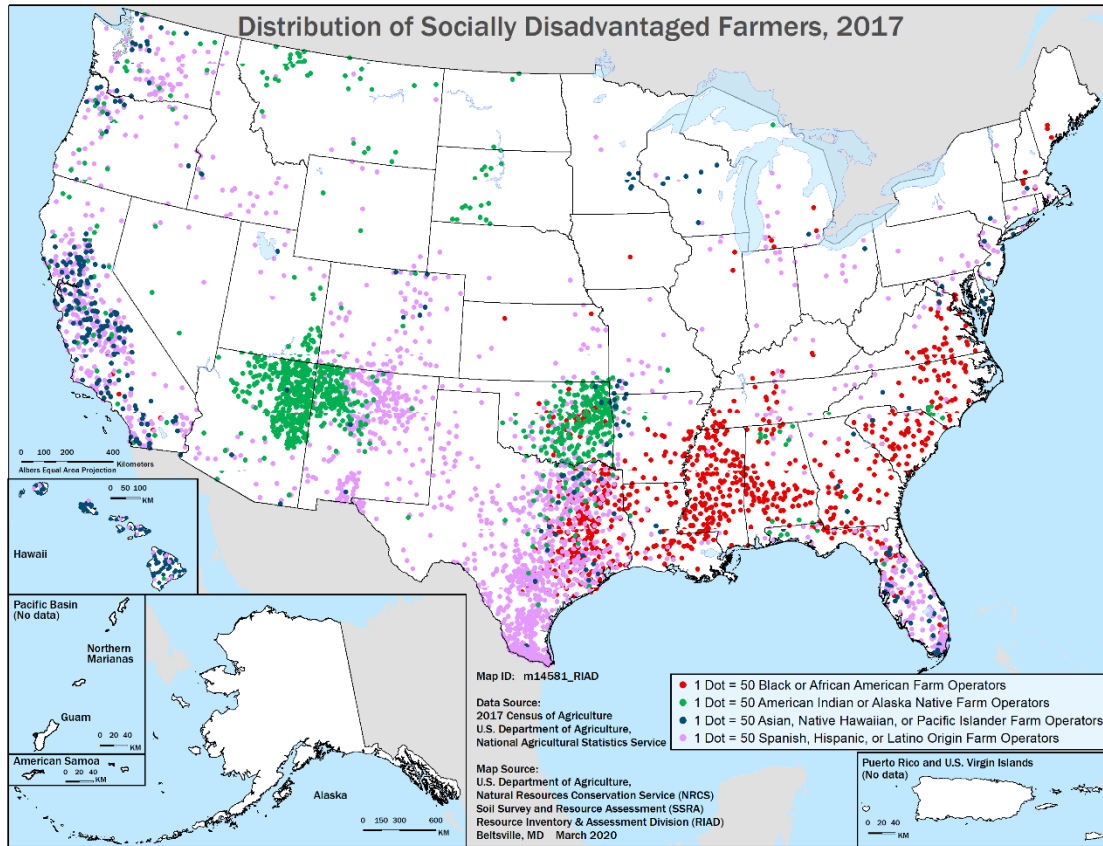
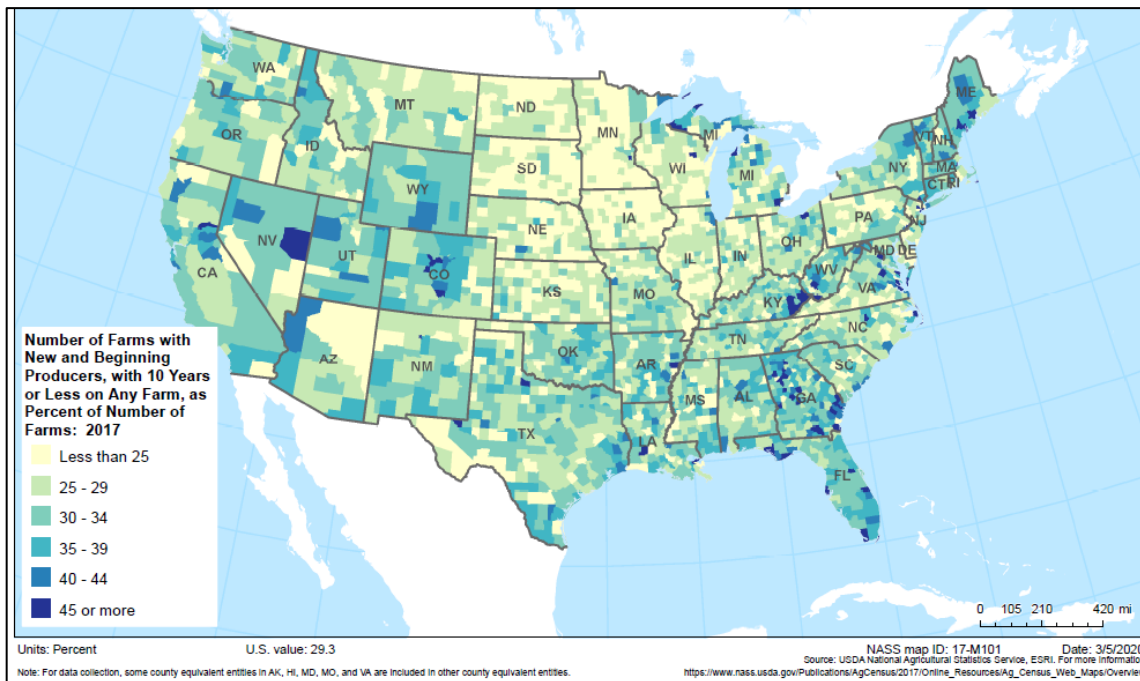


Figure 9: Geographic Distribution of Beginning Farmers



4.5 Alternative 1 – No Action – Continuation of CSP as Implemented under the 2008 and 2014 Farm Bills

This No Action alternative involves continuing CSP as it was implemented under the 2008 and 2014 Farm Bills. This alternative assumes stewardship contracts would be funded based on processes used under the 2014 Farm Bill and that as a result, similar conservation activities would be implemented. This alternative provides a baseline against which to compare the effect of the 2018 Farm Bill changes. CEQ NEPA implementing regulations require analysis of a No Action alternative for this purpose.

4.5.1 Soil, Water, Air, Plant, Animal, and Energy Resources

For the term of the conservation stewardship contract, CSP participants install and adopt new conservation activities and improve, maintain, and manage existing conservation activities in place on the operation to at least the level of stewardship in place when the participant enrolls in the program. Contract payments are provided to participants to implement activities that will meet or exceed planning criteria for additional resource concerns not met at the time of application or for resource concerns improved through the adoption of conservation activities. CSP builds upon practices implemented through EQIP to help the producer achieve higher levels of conservation improvement.

Approximately 167 NRCS conservation practices are available at the national level to address common natural resource concerns.⁴⁴ A subset of these practices, dependent upon the priority resource concerns identified in each State, were available to assist applicants in reaching required stewardship thresholds on their agricultural and nonindustrial private forest lands. Examples of conservation practices commonly used by CSP participants to address natural resource concerns and achieve stewardship thresholds on crop, range, pasture, and forest lands under the 2008 and 2014 Farm Bills are provided in table 3.

Table 3: Examples of NRCS Conservation Practices and Applicability by Land Use

Practice Name	Code	Crop	Pasture	Range	Forest
Brush Management	314		X	X	X
Conservation Crop Rotation	328	X			
Residue & Tillage Management, No-Till	329	X			
Prescribed Burning	338		X	X	X
Cover Crop	340	X			
Critical Area Planting	342	X	X	X	X
Residue Management, Reduced Till	345	X			
Windbreak/Shelterbelt Establishment/Renovation	380/650	X	X	X	
Fuel Break	383		X	X	X
Woody Residue Treatment	384				X
Field Border	386	X			
Riparian Herbaceous Cover/Forest Buffer	390/391	X	X	X	
Filter Strip	393	X			

⁴⁴ See *National Handbook of Conservation Practices* (450-NHCP-620, Amend. 18, September 2019) and individual conservation practices, <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/>, for information on specific conservation practices approved for use at the national level.

Practice Name	Code	Crop	Pasture	Range	Forest
Firebreak	394		X	X	X
Stream Habitat Improvement & Management	395	X	X	X	X
Irrigation Water Management	449	X	X		
Forage Harvest Management	511		X		
Forage & Biomass Planting	512		X		
Prescribed Grazing	528		X	X	X
Range Planting	550			X	
Tree/Shrub Establishment	612				X
Restoration/Mgmt of Rare & Declining Habitats	643	X	X	X	X
Wetland Wildlife Habitat Management	644	X	X	X	X
Upland Wildlife Habitat Management	645	X	X	X	X
Early Successional Habitat Development/Mgmt	647	X	X	X	X
Road/Trail/Landing Closure and Treatment	654				X
Forest Trails & Landings	655				X
Tree/Shrub Pruning	660				X
Forest Stand Improvement	666				X

In addition, over 200 enhancements were available under CSP under the 2008 and 2014 Farm Bills. Enhancements are management activities that go above and beyond the minimum conservation practice standard requirements helping the producer achieve a higher level of conservation. Examples of enhancements that may be used by participants in CSP are provided in appendix C. Installation standards for each enhancement are defined in the applicable enhancement job sheets. Each CSP enhancement is associated with an NRCS conservation practice standard, which has established minimum requirements described in section IV of a State’s electronic FOTG.⁴⁵

“Bundles” of enhancement activities were also available to CSP participants. Bundled enhancements work together to provide increased conservation benefits when they are implemented as a group. Each bundle had three or more required enhancements, and for some bundles, the applicant had the option to pick additional enhancements from a select list that addresses specific resource concerns. Bundles offered a higher level of financial assistance to encourage the holistic approach to generate additional conservation benefits.

NRCS uses a network effects diagram to illustrate the chain of effects (direct, indirect, and cumulative) of applying each conservation practice according to the standard. These network effects diagrams are explained further in appendix A, are available on the NRCS web site,⁴⁶ and are incorporated herein by reference.

There are indirect effects associated with application of conservation activities. For example, activities associated with reducing soil erosion on cropland have indirect effects that include decreased sediment and turbidity in surface waters, improved aquatic habitat, improved air quality, improved

⁴⁵ Local FOTG information is available at the *electronic FOTG* web site, <https://efotg.sc.egov.usda.gov/#/>

⁴⁶ *Practice Network Effect Diagrams* are available at https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

crop productivity, and often improved energy efficiency. Similar impacts result from improved management of livestock and vegetation on pasture and range lands.

Activities applied on forest land may indirectly improve water quantity and quality, improve air quality, and restore or enhance wildlife habitat. Wildlife activities may indirectly improve air and water quality and often result in the creation of potential recreational opportunities. An overview of the potential impacts of applying conservation practices on cropland, grazing lands, and forests is provided (and incorporated herein by reference) in the 2009 EQIP Programmatic EA.⁴⁷

Implementing conservation enhancements under CSP increases the beneficial effects of associated conservation practices as shown on the network effects diagrams. Enhancements provide a higher level of treatment than the minimum required under traditional conservation practice standards. In many cases, this is achieved through implementation of additional management activities. For example, as shown in the network effects diagram for the NRCS Conservation Practice Standard (CPS) Nutrient Management (Code 590) (appendix A), managing the amount, placement, and timing of plant nutrient application can decrease nutrient transport to surface and ground waters. Enhancements involving additional management of nutrient applications, such as using stalk and/or leaf tissue tests to adapt application rates, applying 50 percent or more of the total nitrogen required by a crop after crop emergence, applying all phosphorous fertilizer at least 3 inches deep, and precision application of nutrients based on management zones, can lead to additional reductions in nutrient transport and improved water quality.

While these conservation activities are being implemented, there can be short-term and localized impacts during installation of conservation activities that, on balance, are beneficial for the environment. The locations and extent of those impacts cannot be determined at the national level. This is one of the reasons the site-specific EE process, discussed earlier in section 4.3, is so valuable. This process ensures those site-specific impacts are fully evaluated relative to their local environment and community. Those impacts are also disclosed in the network effects diagrams.

In general, implementation of CSP under the 2008 and 2014 Farm Bills resulted in decreased soil erosion; improved soil, water, and air quality; more efficient use of water and energy; improved plant condition; and improved food, water, and shelter needs for livestock and wildlife.

4.5.2 Socioeconomic Concerns

NRCS conducts outreach to prevent limiting producer participation because of size or type of operation or production system. Outreach efforts have targeted historically underserved producers, specialty crop and organic producers, and other groups identified at the State and local levels.

As noted previously, agricultural operations can have direct, indirect, and cumulative impacts on the human environment. Implementation of conservation activities on these operations through CSP also produce benefits both onsite (to the farm and the farmer) and offsite (to the community and environment) as natural resource concerns are addressed. Examples of socioeconomic benefits are described by CSP participants in [CSP Success Stories](#).

⁴⁷ For the 2009 EQIP Programmatic EA, see https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcs143_006910&ext=pdf

4.5.3 Special Environmental Concerns

It is not anticipated that the types of conservation activities implemented under Alternative 1 would result in adverse impacts to special environmental concerns, particularly those protected by law, Executive order, or agency policy. CSP implementation under Alternative 1 would not result in adverse impacts to prime and unique farmlands, floodplain management, natural areas, or scenic beauty. Activities conducted under this program would not result in land being brought into agricultural production, the intensification of agricultural or forestry production, construction of new structures, or land being converted to nonagricultural uses. Many enhancement activities are designed to improve conditions for special environmental concerns, and should result in beneficial impacts to wetlands, wild and scenic rivers, waters of the United States, coastal zone management areas, coral reefs, essential fish habitat, riparian areas, migratory birds, endangered or threatened species, cultural resources, and historic properties. It is also unlikely that activities would result in a spread of noxious or invasive species; violations of the Clean Air Act or Clean Water Act; or a disproportionately high and adverse effect on the human health or environment of low-income, minority, or Indian populations (environmental justice). In fact, funds are set aside to assist minority populations under the program, resulting in benefits to this group and a reduction in resource concerns on their lands.

The effects of the conservation activities may vary somewhat depending on the local ecosystems, landscape position, methods of installation, and scope or magnitude of the activity. Impacts are evaluated at a more localized level through additional State and local NEPA analyses when needed and use of the site-specific EE prior to contract implementation. NRCS consults with regulatory agencies on State and local levels, as needed and as appropriate, to ensure that actions do not adversely affect resources protected by law. NRCS also implements activities in a manner that is consistent with NRCS policy to minimize adverse effects, through appropriate avoidance or other mitigating measures, to the extent feasible.⁴⁸ The use of the site-specific EE and other established agency procedures and policies for compliance with two specific regulatory authorities, the National Historic Preservation Act (NHPA) and the Endangered Species Act (ESA), are discussed below.

4.5.3.1 National Historic Preservation Act

To ensure compliance with section 106 of the NHPA⁴⁹ and associated authorities, NRCS primarily follows the procedures developed in accordance with a nationwide prototype programmatic agreement between NRCS, the Advisory Council on Historic Preservation (ACHP), and the National Conference of State Historic Preservation Officers,⁵⁰ which called for NRCS to develop consultation agreements with State historic preservation officers (SHPOs) and federally recognized Tribes, or their designated Tribal historic preservation officers (THPOs). These State-level consultation agreements focus historic preservation reviews on resources and locations that are of special regional concern to these parties. Importantly, these consultation agreements also streamline the more inclusive section 106 regulations of the ACHP⁵¹ by exempting certain types of undertakings from review. For example, conservation activities like planting a cover crop on existing cropland would have little likelihood of affecting historic properties. Such projects would not require consultation if a State-level agreement with SHPOs or Tribes determines the NRCS CPS Cover Crop (Code 340) is not an undertaking when implemented on existing cropland. However, historic preservation review with consulting parties would be necessary under these consultation agreements for undertakings that would likely impact

⁴⁸ See *NRCS Environmental Policy*, NRCS General Manual Title 190, Part 410, Subpart A, <https://directives.sc.egov.usda.gov/viewerFS.aspx?id=666>

⁴⁹ 16 U.S. Code 470, as amended.

⁵⁰ ACHP Prototype Programmatic Agreements, https://www.achp.gov/program_alternatives/prototype_pa

⁵¹ 36 CFR 800.

historic properties. In cases where there are no State-level agreements or Tribal consultation protocols for Tribes that have an interest in the activity, NRCS must comply with the provisions of the ACHP Section 106 regulations prior to proceeding to implementation of the action.

A site-specific EE and section 106 review and consultation identifies the likely presence or absence of historic properties that need further consideration under NHPA. In such cases, historic preservation professionals who meet the Secretary of Interior's professional qualification standards conduct onsite identification and evaluation studies as needed to determine whether there are or are not historic properties within the area of potential effects. If historic properties are present, these same historic preservation professionals must report to NRCS whether there would be an effect and define the nature of the effect. If there is an adverse effect, NRCS must determine whether the undertaking (conservation activity or system) may be moved or modified to avoid effects.

If a historic property would be affected by the proposed conservation activity or system (undertaking), the State Conservationist, SHPO, American Indian Tribes/THPOs, and other consulting parties consult on the need for site-specific mitigation measures or treatments, including avoidance of adverse effects by slight relocation or redesign of the conservation activity or system, if feasible. If an adverse effect is anticipated, NRCS must submit documentation to the ACHP as part of the section 106 process, and preparation of an EA or EIS may also be warranted. Documentation may include comments from all the consulting parties and a proposed memorandum of agreement agreed upon by all the consulting parties that outline the steps that will be taken to avoid, treat, minimize, or mitigate the adverse effects and afford the ACHP an opportunity to participate in resolution of any potential adverse effects.

4.5.3.2 Endangered Species Act

For ESA compliance involving CSP activities, NRCS conducts section 7(a)(2) interagency consultation with the appropriate regulatory agency (U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services), as necessary) when endangered or threatened species may be affected, or critical habitats destroyed or adversely modified. Through the section 7 process, determinations will be made regarding whether the proposed action is "not likely to adversely affect," or is "likely to adversely affect" endangered or threatened species. When they are present, determinations will also be made regarding impacts to designated critical habitats.

In some States, NRCS has undertaken section 7 programmatic consultations and has a programmatic agreement in place that outlines an agreed-upon process. Certain conservation practices or activities may have been predetermined to be within a category of actions having "no effect" or "may affect, not likely to adversely affect" (including beneficial effects) endangered or threatened species. However, a section 7 programmatic agreement with the Services may also specify measures that are required to be implemented in conjunction with the proposed conservation activities in order to apply a "no effect" and "may affect, not likely to adversely affect" determination. If such practices or actions are implemented according to the programmatic agreement between the agencies, there may be no further need to consult under section 7 of the ESA.

If a section 7 programmatic agreement is not in effect and the action has the potential for effects (beneficial or adverse), or if the programmatic agreement has predetermined that a conservation activity is "likely to adversely affect" an endangered or threatened species, a site-specific section 7 consultation is needed. This may involve additional analysis and documentation through informal or formal consultation as required by the ESA and preparation of an EA or EIS may also be warranted.

4.5.4 Mitigation and Adaptive Management

As part of the conservation planning process and CSP contract development process, a site-specific EE is prepared and any adverse effects to natural resource concerns are identified and addressed. NRCS recognizes that an activity designed and intended to improve one resource concern may have unintended adverse consequences that can result in the degradation of one or more other resource concerns. The network effects diagrams described in appendix A include mitigating practices in those situations where unintended adverse impacts have been identified. NRCS staff can use these diagrams to assist them in determining the potential for unintended adverse effects and identification of appropriate mitigating actions to comply with NRCS policy to minimize adverse effects, through appropriate avoidance or other mitigating measures, to the extent feasible.⁵² Programmatic agreements also exist in some States that identify appropriate mitigating measures as discussed above in section 4.5.3.

Adaptive management is also an integral part of the conservation planning process. NRCS staff maintain contact with landowners throughout the life of the CSP contract and follow-up to ensure that conservation activities are applied to address priority natural resource concerns as agreed to under the contract. Contracts can be modified, as necessary, to obtain the desired outcomes, although additional payments cannot be added during the initial contract period for activities not included in the original contract.

4.5.5 Permits and Permitting

It is not anticipated that Federal, State, Tribal, or local permits will be needed for the vast majority of CSP activities, most of which will involve a higher level of management for ongoing agricultural and forestry activities. NRCS evaluates each conservation activity in the contract development stage at the State level to determine if permits may be required. If permits are needed for an activity, CSP participants are responsible for obtaining them, and NRCS will not proceed with technical or financial assistance for application of the activity until the permit is obtained as required by NRCS policy.⁵³

4.5.6 Cumulative Impacts

CEQ regulations stipulate that a cumulative effects analysis be conducted to consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such other actions.”⁵⁴ Cumulative effects most likely arise when a relationship exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. An action which overlaps with or is in proximity to other proposed actions would be expected to have more potential for a cumulative effect relationship than actions that are more geographically separated. Similarly, actions that coincide, even partially, in time tend to have potential for cumulative effects.

Cumulative impacts have been identified on the network effects diagrams for NRCS conservation practices. Individual conservation activities and systems result in cumulative effects upon soil, water,

⁵² See *NRCS Environmental Policy*, NRCS General Manual Title 190, Part 410.3, <https://directives.sc.egov.usda.gov/viewerFS.aspx?id=666>

⁵³ *Compliance with Laws and Regulations*, NRCS General Manual Title 450 Part 405.1, <https://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17079>

⁵⁴ *CEQ Regulations for Implementing NEPA*, 40 CFR Part 1508.7, http://energy.gov/sites/prod/files/NEPA-40CFR1500_1508.pdf

air, plants, animals, energy, and humans. Soil erosion reductions are additive. Improvements in water quality are produced by a variety of practices on all land uses. Plant productivity increases from the application of a variety of practices on cropland, pastureland, and forest land. Wildlife benefits occur from practices on all land uses. Enhancements require more than the minimum criteria in conservation practice standards be met, and therefore, result in more cumulative benefits than those described in the network effects diagrams for associated practices.

Income stability from agricultural or forest production, community economic returns, and often human health and safety also tend to improve on a cumulative level when conservation practices are applied across the landscape.

When combined with CSP implementation, cumulative impacts from other Federal, State, Tribal, and local entities might result from—

- Regulatory mandates and statutory requirements.
- Technical assistance provided by NRCS without financial assistance.
- Financial and technical assistance provided through other conservation programs.

The cumulative total of environmental impacts associated with implementation of CSP is difficult to measure and varies depending upon the location and timing of application of conservation activities across the landscape. Overall, CSP has had and will continue to have a cumulative positive benefit to the environment both on and off the site where conservation activities are implemented. These cumulative benefits can be enhanced by targeted financial assistance, which focuses assistance on priority resource concerns at the State and local levels as will be done in CSP.

In addition to CSP, there are other voluntary conservation programs that help to conserve, enhance, protect, and improve working lands. A brief overview of the relevant Federal programs is provided below. Other programs could be used on the same or adjacent agricultural and forestry lands and, therefore, may result in overlapping cumulative effects.

4.5.7 Other Farm Bill Programs

4.5.7.1 Agricultural Conservation Easement Program

The Agricultural Conservation Easement Program (ACEP) is a voluntary easement program comprised of an agricultural land easement (ALE) component on farms and ranches that protects them from development and a wetland reserve easement component (WRE) for restoring and protecting wetlands that have previously been impacted by agricultural practices. The 2014 Farm Bill created the ACEP by merging the Farm and Ranch Lands Protection Program, the Grassland Reserve Program, and the Wetlands Reserve Program, each of which was in effect during the period of the 2008 Farm Bill.

4.5.7.2 Conservation Reserve Program

The Conservation Reserve Program (CRP) pays producers to establish vegetative cover on environmentally sensitive cropland and marginal pastureland. This voluntary program has also been characterized as a land “retirement” program designed to idle existing cropland over 10- to 15-year contract periods. The intent of the program is to temporarily retire marginally productive lands that also contribute considerable amounts of pollutants to surface waters when used for agricultural production or provide important wildlife benefits if idled with appropriate vegetative cover, or both.

4.5.7.3 Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to landowners and operators to voluntarily address resource concerns on working agricultural and forestry lands through the installation or implementation of structural and management practices. Payments representing up to 75 percent of the average incurred costs and income foregone of certain conservation practices and activities are provided. NRCS promotes CSP and EQIP as complementary programs. EQIP is used by potential CSP participants to reach stewardship thresholds.

4.5.7.4 Healthy Forest Reserve Program

The Healthy Forest Reserve Program (HFRP) helps forest landowners to restore, enhance, and protect forest lands. The purposes of the voluntary program are to promote the recovery of threatened and endangered species, improve biodiversity, and enhance carbon sequestration. Like ACEP-WRE, landowners are offered a variety of easement options, and financial assistance is provided to implement practices needed to achieve the purposes of the program. Land enrolled in HFRP is eligible for CSP.

4.5.7.5 Regional Conservation Partnership Program

The Regional Conservation Partnership Program (RCPP) encourages partners to join in efforts with producers to increase the restoration and sustainable use of soil, water, wildlife, and related natural resources on regional or watershed scales. Through the program, NRCS and its partners help producers install and maintain conservation activities in selected project areas. Partners leverage RCPP funding in project areas and report on the benefits achieved.

4.5.7.6 Federal and State Forestry Programs

The U.S. Forest Service, through its State and Private Forestry (S&PF) mission area provides expert advice, technology, and financial assistance to help landowners and resource managers sustain the Nation's forests and protect communities and the environment from wildland fires. Through grants and cooperative agreements, State forestry agencies and other partners deliver the majority of this landowner assistance through three State and Private Forestry "umbrella" program areas that receive annual Federal appropriations: Forest Health Management, Cooperative Fire Protection, and Cooperative Forestry.

Forest Health Management assistance includes conducting suppression, prevention, and management activities on native and nonnative insect and disease forest pests and invasive plants.

Cooperative Fire Protection programs focus on the urgent need to reduce the threat of wildland fires in wildland-urban interface areas. Assistance is provided to complete community wildfire protection plans and to implement high priority hazard-mitigation projects identified in those plans, which often includes nonindustrial private forestlands.

Cooperative Forestry Programs include the Forest Stewardship Program and the Forest Legacy Program. The Forest Stewardship Program provides technical and financial assistance to States to encourage the long-term stewardship of nonindustrial private forestland. Long-term multi-resource forest stewardship plans provide landowners with the information they need to achieve their unique objectives while sustaining a variety of environmental goods and services including clean air and water, biodiversity, and wildlife habitat. Forest stewardship plans enable landowners to keep their forests in a healthy condition to reduce the risk of wildfire and pest/disease infestations. Forest stewardship plans also contribute to the future supply of forest products from private lands and thus,

the health of our rural economies.

The Forest Legacy Program helps protect environmentally important Forest areas that are threatened by conversion to nonforest uses. The program uses conservation easements and other mechanisms to conserve private forests and operates on a “willing seller and willing buyer” basis. Eminent domain or adverse condemnation is not authorized.

4.6 Alternative 2 – Proposed Action – Implementation of 2018 CSP Requirements

Under Alternative 2, NRCS will continue to provide financial and associated technical assistance to private agricultural and nonindustrial forest landowners under CSP. CSP will be more closely coordinated with EQIP than it has been in the past, including the procedures used for applications, contracting, conservation planning, and conservation activities.

Overall, the impacts of Alternative 2 are expected to be very similar to those described in Alternative 1. Soil erosion will decrease, soil quality will be improved, water quality will improve, water quantity issues will be addressed, water will be used more efficiently, air quality will improve, plant condition will improve, needs will be met for livestock and wildlife, and energy will be used more efficiently. Socioeconomic benefits will improve both onsite (to the farm and the farmer) and offsite (to the community and environment) as natural resource concerns are addressed.

CSP implementation under Alternative 2 also will not result in adverse impacts to prime and unique farmlands, floodplain management, natural areas, or scenic beauty. Activities conducted under this program will not result in land being brought into agricultural production, the intensification of agricultural or forestry production, construction of new structures, or land being converted to nonagricultural uses. Due to the nature of the activities proposed and the requirement for site-specific environmental evaluations for all financial assistance contracts (see section 4.3), it is unlikely that there will be detrimental impacts to wetlands, wild and scenic rivers, waters of the United States, coastal zone management areas, coral reefs, essential fish habitat, riparian areas, migratory birds, endangered or threatened species, cultural resources, or historic properties. It is also unlikely that activities will result in a spread of noxious or invasive species; violations of the Clean Air Act or Clean Water Act; or a disproportionately high and adverse effect on the human health or environment of low-income and minority populations or Indian Tribes (environmental justice). In fact, funds are set aside to assist minority populations under the program, resulting in benefits to this group and a reduction in resource concerns on their lands.

The effects of the conservation activities may vary somewhat depending on the local ecosystems, landscape position, methods of installation, and scope or magnitude of the activity. Impacts will be evaluated at a more localized level through additional State and local NEPA analyses or use of the site-specific EE prior to program implementation. NRCS will consult with regulatory agencies on State and local levels, as needed and as appropriate, to ensure that actions do not adversely affect resources protected by law. NRCS also implements activities in a manner that is consistent with NRCS policy to minimize adverse effects, through appropriate avoidance or other mitigating measures, to the extent feasible.⁵⁵ The use of the site-specific EE and other established agency procedures and policies for compliance with two specific regulatory authorities, the NHPA and the ESA, as discussed above.

⁵⁵ See *NRCS Environmental Policy*, NRCS General Manual Title 190, Part 410, Subpart A, <https://directives.sc.egov.usda.gov/viewerFS.aspx?id=666>

Mitigation and adaptive management will also be implemented as necessary under Alternative 2, as described above.

When permits are necessary, NRCS will not proceed with technical or financial assistance for application of the activity until the permit is obtained as required by NRCS policy.⁵⁶

Under Alternative 2, eligible applicants will be ranked at the State level within the applicable ranking pool(s), and those who rank sufficiently high to be approved for CSP contracts, will receive compensation for carrying out additional conservation activities to improve and conserve the quality and condition of natural resources. Conservation activities implemented under CSP will continue to be directed to address priority resource concerns which have been identified within the State by the State Conservationist in consultation with the State Technical Committee. Therefore, priority resource concerns will continue to be addressed to a level that meets or exceeds the identified stewardship threshold.

The primary differences in the environmental impacts of Alternative 2 compared to Alternative 1 will result from mandatory changes to CSP required by the 2018 Farm Bill. These differences are summarized below.

The 2018 Farm Bill specifies that CSP funding be distributed to States each year based primarily on each State's proportion of eligible land to the total acreage of eligible land in all States and among other considerations, to achieve equitable geographic distribution of funds. States will receive allocations for CSP based on funds available, rather than acres. States will also receive allocations to support organic production and transition to organic production based on the certified and transitioning organic operations of the State and the organic and transitioning to organic acres of the State. Overall the change from an acre-based to a funding-based program along with removal of the requirement for a national average CSP payment of \$18 per acre, results in a reduction in CSP funding from \$9 billion to \$3.975 billion. As a result, fewer acres of land will be enrolled in CSP each fiscal year and the extent of lands receiving conservation treatment will be reduced compared to Alternative 1.

As required by the 2018 Farm Bill, CSP will be managed to the greatest extent practicable to enhance soil health. Farming using soil health principles and systems that include the use of reduced tillage, cover crops, and diverse crop rotations results in increased soil organic matter and soil microbial activity. Healthy soil sequesters more carbon, increases water infiltration, and can improve wildlife and pollinator habitat, as well as increase crop yields. Under Alternative 2, NRCS will implement this requirement by modifications to CSP enhancement job sheets to specify criteria participants must use to enhance soil health.

The 2018 Farm Bill requires higher payments for cover crops, resource-conserving crop rotations, and the newly authorized advanced grazing management supplemental payment. In addition, it requires a one-time payment for the development and implementation of a comprehensive conservation plan. These new authorities will increase the CSP contract acres using conservation activities associated with cover crops, resource-conserving crop rotations, and advanced grazing management. The increase in acres will result in more of the beneficial impacts described in the network effects diagrams for the associated NRCS CPSs Cover Crop (Code 340), Conservation Crop

⁵⁶ *Compliance with Laws and Regulations*, NRCS General Manual Title 450 Part 405.1, <https://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17079>

Rotation (Code 328), and Prescribed Grazing (Code 528). Development of comprehensive conservation plans will result in more priority resource concerns being addressed.

The 2018 Farm Bill also mandates the establishment of a Grassland Conservation Initiative for eligible producers with uncropped acreage base. Beginning in FY 2019, USDA will provide a one-time election for a producer to enroll eligible land in the initiative. Targeted mailings will be used to inform producers with eligible land of the opportunity to enroll. Participating producers must agree to meet or exceed the stewardship threshold for not less than one priority resource concern by the date on which the contract expires. Grassland Conservation Initiative contracts will be for a single 5-year term not subject to renewal. Participants may terminate the contract at any time and retain payments already received under the contract. The annual payment is limited to \$18 per acre and cannot exceed the acres enrolled in an initiative contract. Participants must meet eligibility conditions for the CSP, but do not have to go through the ranking process. The Grassland Conservation Initiative is expected to protect grazing uses; conserve and improve soil, water, and wildlife resources; and achieve related conservation values by encouraging producers to maintain land in grass cover that could otherwise be cultivated to produce annual crops.

The Farm Service Agency estimates that there are approximately 2.5 million acres eligible for the Grassland Conservation Initiative. Based on this estimate the Grassland Conservation Initiative would use approximately 5.5 percent of total authorized funding for CSP under the 2018 Farm Bill. This will also result in a slight decline in other conservation activities being implemented under CSP. The eligible acres are concentrated in Texas, Oklahoma, and Kansas; however, the Grassland Conservation Initiative will be available across the contiguous 48 States.

4.6.1 Unavoidable Adverse Impacts

The proposed action (Alternative 2) is not anticipated to cause any direct adverse effects on any resources due to the nature of the national CSP rulemaking actions being considered. Alternative 2 is also not anticipated to result in any indirect or cumulative adverse effects on any resources based on the implementation of conservation activities, as these activities are designed to enhance and improve natural resources. NRCS policy also requires that conservation plans avoid or mitigate unintended adverse environmental impacts to natural resources. Additionally, any such impacts would be evaluated as part of the site-specific process (see section 4.3) for CSP-funded activities.

4.6.2 Relationship of Short-Term Use and Long-Term Productivity

The proposed action (Alternative 2) would have few, if any, adverse short-term impacts to resources. However, unintended short-term adverse impacts would be mitigated to the maximum extent possible and would lead to a higher level of long-term productivity for natural resources. The long-term productivity would result from conservation planning efforts and activities designed to enhance soil, water, air, plant, animal, and energy resources above the stewardship threshold level. These considerations would all be factored into the site-specific EE process (see section 4.3) for CSP-funded activities.

4.6.3 Irreversible and Irrecoverable Commitment of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effect that the use of these resources has on future generations. Irreversible effects primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There will be no irreversible and irretrievable

commitments of resources resulting from the national rulemaking process or implementation of CSP under either of the alternatives included in this Programmatic EA.

5 PERSONS AND AGENCIES CONSULTED

Sarah Brooks	Natural Resource Specialist, NRCS Programs Policy Branch, District of Columbia
David Buland	Retired Economist, NRCS Central National Technology Support Center, Texas
Karen Fullen	Ecologist/Environmental Compliance Specialist, NRCS West National Technology Support Center, Oregon
Nell Fuller	Director, Environmental Activities Division, Farm Production and Conservation Business Center, District of Columbia
Martha Joseph	Senior Policy Advisor, NRCS Policy and Program Analysis Division, District of Columbia
Don Riley	Ecologist/Environmental Compliance Specialist, NRCS East National Technology Support Center, North Carolina
Jason Steele	Management Analyst, NRCS Strategic Support Services Division, District of Columbia
Michael Whitt	Branch Chief, NRCS Programs Policy Branch, District of Columbia
Irma Hernandez-Zelek	Natural Resource Specialist, NRCS Programs Policy Branch, District of Columbia

6 APPENDICES

Appendix A: Conservation Network Effects Diagrams

To assist in the analysis of environmental impacts, NRCS has developed conservation network effects diagrams depicting the chain of natural resource effects resulting from the application of each conservation practice. Each of the diagrams first identifies the typical setting to which the practice is applied. This includes identification of the predominating land use and the environmental resource concerns that trigger use of the conservation practice. The diagrams then identify the conservation practice(s) used to mitigate or address the resource concerns. One network effects diagram for the NRCS Conservation Practice Standard Nutrient Management (Code 590) is provided below. All of the available network effects diagrams are incorporated by reference and can be viewed at the following web site:


https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/neps/?cid=nrcs143_026849.

Following identification of the conservation practice, there is a description of the physical activities that are carried out to implement the practice. From there, the diagrams depict the occurrence of the direct, indirect, and cumulative effects of the practice. Effects are qualified with a “+” or “-“ which qualitatively denotes an increase (“+”) or decrease (“-”) in the effect. Pluses and minuses do not equate to good and bad or positive and negative. Impacts are characterized in this manner because site-specific conditions can influence the degree or intensity of the potential environmental impact. Only the general effects that are considered the most important ones from a national perspective are illustrated.

Additional information on the process used to develop the network effects diagrams is available in the NRCS Watershed Science Institute Report CED-WSSI-2002-2, “Analyzing Effects of Conservation Practices – A Prototypical Method for Complying with National Environmental Policy Act (NEPA) Requirements for Farm Bill Implementation.” This document is included in the NRCS National Environmental Compliance Handbook, Subpart H, Section 610.127, and is available through the NRCS electronic directives system at

<https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=39475.wba>

NUTRIENT MANAGEMENT



**United States
Department of
Agriculture**

Conservation Practice Overview

May 2019

Nutrient Management (Code 590)

Manage rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts.

Practice Information

Nutrient management may be used on any area of land where plant nutrients and soil amendments are applied. Nutrient management may be used to improve crop productivity and improve soil organic matter while reducing environmental impacts. Sources of nutrients include, but are not limited to, commercial fertilizers (including starter and in-furrow starter/pop-up fertilizer), animal manures, legume fixation credits, green manures, plant or crop residues, compost, organic by-products, municipal and industrial biosolids, wastewater, organic materials, estimated plant available soil nutrients, and irrigation water.

Nutrients are managed based on the 4Rs of nutrient stewardship—apply the right nutrient source at the right rate at the right time in the right place—to improve nutrient use efficiency by the crop and to reduce nutrient losses to surface water and groundwater and to the atmosphere.


Operation and maintenance provide that nutrient management plans must be reviewed and revised, as needed, with each soil test cycle; changes in manure management, volume or analysis, plants and crops; or plant and crop management. Records must be maintained for at least 5 years to document plan implementation.

All nutrient management activities must adhere to national, State and local water quality regulations.

Common Associated Practices

NRCS Conservation Practice Standard Nutrient Management (Code 590) is commonly applied with CPSs such as Residue and Tillage Management, No Till (329), Residue and Tillage Management, Reduced Till (345), Conservation Crop Rotation (Code 328), Filter Strip (Code 393), Cover Crop (Code 340), Contour Farming (Code 330), and Contour Buffer Strips (Code 332).

For further information, contact your local NRCS field office.



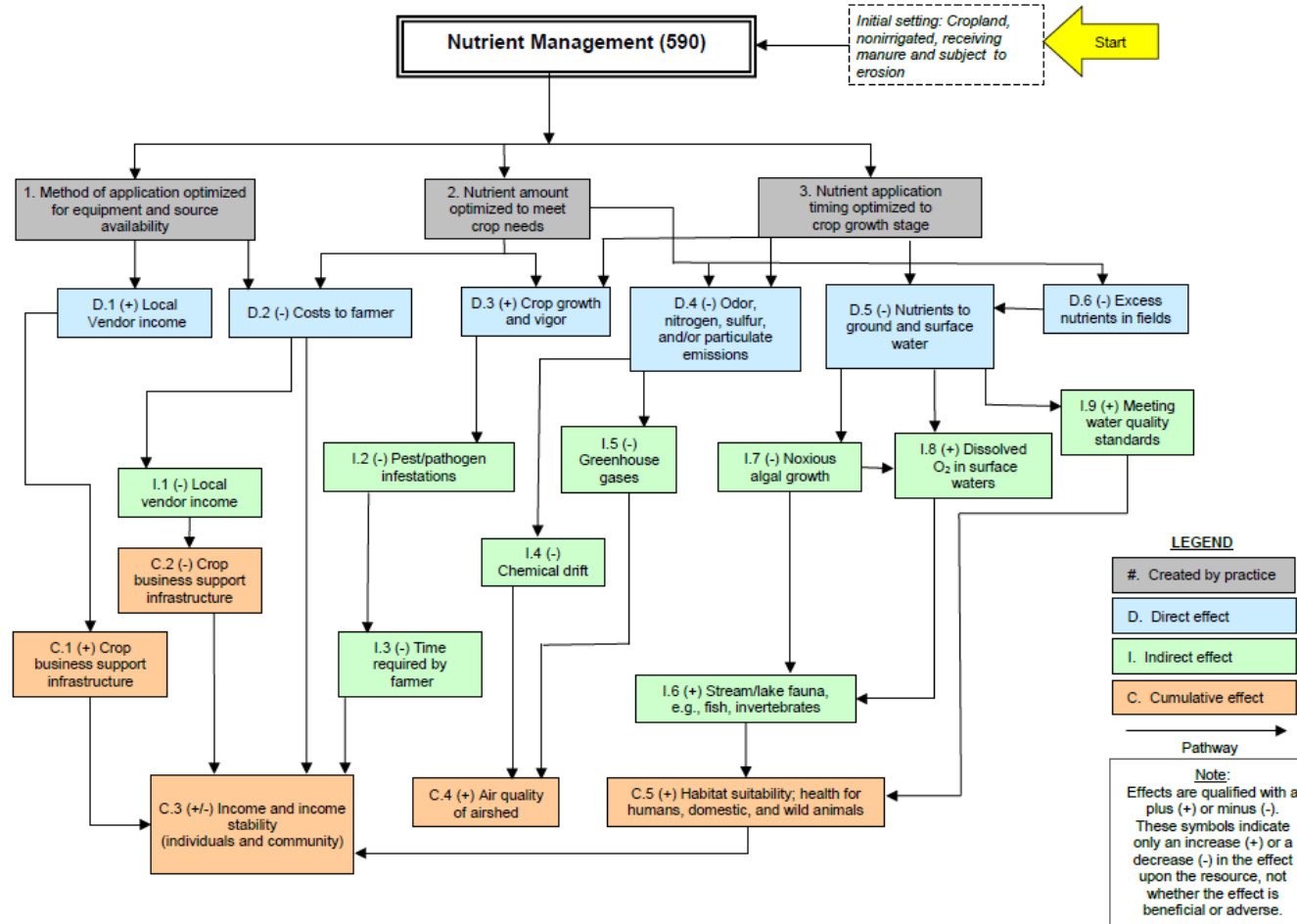
Natural Resources Conservation Service

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NRCS CONSERVATION PRACTICE EFFECTS - NETWORK DIAGRAM

May 2019



The diagram above identifies the effects expected to occur when this practice is applied according to NRCS practice standards and specifications. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. All appropriate local, State, Tribal, and Federal permits and approvals are the responsibility of the landowners and are presumed to have been obtained. All income changes are partially dependent upon market fluctuations which are independent of the conservation practices. Users are cautioned that these effects are estimates that may or may not apply to a specific site.

Appendix B: Conservation Practices Commonly Used to Address Resource Concerns

Note: For additional information see the National Handbook of Conservation Practices (450-NHCP-620, Amend. 18, September 2019) and for individual conservation practices, see <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/cp/ncps/>

Resource Concern	Conservation Activities to Address Concern
Soil	
Soil – Sheet and rill erosion; wind erosion	Alley Cropping (311); Conservation Cover (327); Contour Buffer Strips (332); Contour Farming (330); Contour Orchard and Other Perennial Crops (331); Cover Crop (340); Critical Area Planting (342); Mulching (484); Multi-Story Cropping (379); Forage and Biomass Planting (512); Prescribed Grazing (528); Range Planting (550); Residue and Tillage Management (329, 345); Row Arrangement (557); Stripcropping (585); Terrace (600); Vegetative Barriers (601)
Soil – Ephemeral gully erosion; Classic gully erosion	Alley Cropping (311); Cover Crop (340); Critical Area Planting (342); Grassed Waterway (412); Lined Waterway or Outlet (468); Precision Land Forming (462); Prescribed Grazing (528); Stripcropping (585); Terrace (600); Tree and Shrub Establishment (612); Underground Outlet (620); Vegetative Barriers (601)
Soil – Bank erosion from streams shorelines or water conveyance channels	Access Control (472); Critical Area Planting (342); Prescribed Grazing (528); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390); Stream Habitat Improvement and Management (395); Streambank and Shoreline Protection (580); Watering Facility (614)
Soil – Organic Matter Depletion	Alley Cropping (311); Conservation Cover (327); Conservation Crop Rotation (328); Cover Crop (340); Multi-Story Cropping (379); Prescribed Grazing (528); Residue and Tillage Management (329, 345); Tree and Shrub Establishment (612)
Soil – Compaction	Access Control (472); Conservation Cover (327); Controlled Traffic Farming (334); Deep Tillage (324); Forage Harvest Management (511), Grazing Land Mechanical Treatment (548); Prescribed Grazing (528); Residue and Tillage Management (329, 345)
Soil – Concentration of salts or other chemicals	Agrichemical Handling Facility (309); Conservation Cover (327); Conservation Crop Rotation (328); Integrated Pest Management (595); Irrigation Water Management (449); Nutrient Management (590); Prescribed Grazing (528); Salinity and Sodic Soil Management (610); Subsurface Drain (606)
Soil – Subsidence	Drainage Water Management (554); Pumping Plant (533)
Soil – Soil organism habitat loss or degradation	Alley Cropping (311); Conservation Cover (327); Conservation Crop Rotation (328); Cover Crop (340); Forage and Biomass Planting (512); Multi-Story Cropping (379); Prescribed Grazing (528); Residue and Tillage Management (329, 345); Riparian Forest Buffer (391); Tree and Shrub Establishment (612)
Soil – Aggregate instability	Alley Cropping (311); Conservation Cover (327); Conservation Crop Rotation (328); Cover Crop (340); Forage and Biomass Planting (512); Grassed Waterway (412); Multi-Story Cropping (379); Prescribed Grazing (528); Residue and Tillage Management (329, 345); Riparian Forest Buffer (391); Tree and Shrub Establishment (612)

Resource Concern	Conservation Activities to Address Concern
Water	
Water – Ponding and flooding; Seasonal high-water table; Seeps; and Drifted snow	Dike (356); Diversion (362); Drainage Water Management (554); Grassed Waterway (412); Hillside Ditch (423); Precision Land Forming (462); Pumping Plant (533); Stormwater Runoff Control (570); Structure For Water Control (587); Subsurface Drain (606); Underground Outlet (620); Vertical Drain (630); Water and Sediment Control Basin (638); Wetland Creation, Enhancement, and Restoration (658, 659, 657)
Water – Surface water depletion; Ground water depletion	Dam, Diversion (348); Forage and Biomass Planting (512); Riparian Forest Buffer (391); Structure For Water Control (587); Tree and Shrub Establishment (612)
Water – Inefficient use of irrigation water	Irrigation Field Ditch (388); Irrigation Land Leveling (464); Irrigation Reservoir (436); Irrigation System (441, 443, 447); Irrigation Water Management (449)
Water - Pesticides transported to surface or ground water	Agrichemical Handling Facility (309); Filter Strip (393); Irrigation System, Microirrigation (441); Irrigation System, Tailwater Recovery (447); Irrigation Water Management (449); Integrated Pest Management (595); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390)
Water - Nutrients transported to surface or ground water	Access Control (472); Agrichemical Handling Facility (309); Conservation Cover (327); Filter Strip (393); Heavy Use Area Protection (562); Irrigation Water Management (449); Nutrient Management (590); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390)
Water - Sediment transported to surface water	Access Control (472); Alley Cropping (311); Anionic Polyacrylamide (PAM) Erosion Control (450); Conservation Cover (327); Cover Crop (340); Critical Area Planting (342); Filter Strip (393); Irrigation Water Management (449); Residue and Tillage Management (329, 345); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390); Sediment Basin (350); Stream Crossing (578); Streambank and Shoreline Protection (580); Stripcropping (585); Terrace (600); Tree and Shrub Establishment (612); Vegetated Treatment Area (635); Vegetative Barriers (601); Water and Sediment Control Basin (638)
Water - Pathogens and chemicals; Salts; Petroleum, heavy metals, and other pollutants; transported to surface or ground water	Access Control (472); Agrichemical Handling Facility (309); Anionic PAM Erosion Control (450); Conservation Cover (327); Constructed Wetland (656); Filter Strip (393); Heavy Use Area Protection (562); Irrigation System, Tailwater Recovery (447); Irrigation Water Management (449); Nutrient Management (590); On-farm Secondary Containment Facility (319); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390)
Water – Elevated water temperature	Access Control (472); Stream Habitat Improvement and Management (395); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390)

Resource Concern	Conservation Activities to Address Concern
Air	
Air - Emissions of Particulate Matter (PM) and PM Precursors	Alley Cropping (311); Combustion System Improvement (372); Conservation Cover (327); Cover Crop (340); Dust Control from Animal Activity on Open Lot Surfaces (375); Dust Control on Unpaved Roads and Surfaces (373); Field Operations Emissions Reduction (376); Firebreak (394); Woody Residue Treatment (384); Forest Stand Improvement (666); Fuel Break (383); Hedgerow Planting (422); Herbaceous Wind Barriers (603); Prescribed Grazing (528); Residue and Tillage Management (329, 345); Stripcropping (585); Surface Roughening (609); Windbreak/Shelterbelt Establishment and Renovation (380, 650)
Air - Emissions of Ozone Precursors	Combustion System Improvement (372); Farmstead Energy Improvement (374); Field Operations Emissions Reduction (376); Residue and Tillage Management (329, 345)
Air - Emissions of Greenhouse Gases (GHGs)	Combustion System Improvement (372); Conservation Cover (327); Cover Crop (340); Farmstead Energy Improvement (374); Feed Management (592); Nutrient Management (590); Residue and Tillage Management (329, 345); Riparian Forest Buffer (391); Tree and Shrub Establishment (612)
Air – Objectionable odors	Amendments for Treatment of Agricultural Waste (591); Composting Facility (317); Hedgerow Planting (422); Nutrient Management (590); Roofs and Covers (367); Waste Separation Facility (632); Waste Treatment (629); Windbreak/Shelterbelt Establishment and Renovation (380, 650)
Plants	
Plants – Plant productivity and health; Plant structure and composition	Access Control (472); Alley Cropping (311); Brush Management (314); Conservation Crop Rotation (328); Early Successional Habitat Development/Management (647); Field Border (386); Firebreak (394); Forage Harvest Management (511); Forest Stand Improvement (666); Fuel Break (383); Irrigation Water Management (449); Multi-Story Cropping (379); Nutrient Management (590); Forage and Biomass Planting (512); Integrated Pest Management (595); Prescribed Burning (338); Prescribed Grazing (528); Range Planting (550); Riparian Forest Buffer (391); Salinity and Sodic Soil Management (610); Silvopasture Establishment (381); Tree/Shrub Establishment (612); Tree/Shrub Pruning (660); Tree/Shrub Site Prep (490); Upland Wildlife Habitat Management (645); Wetland Creation, Enhancement, and Restoration (658, 659, 657); Wetland Wildlife Habitat Management (644)
Plants – Plant pest pressure	Access Control (472); Brush Management (314); Critical Area Planting (342); Forest Stand Improvement (666); Herbaceous Weed Treatment (315); Prescribed Burning (338); Prescribed Grazing (528); Restoration and Management of Rare and Declining Habitats (643); Upland Wildlife Habitat Management (645); Wetland Enhancement (659); Wetland Restoration (657); Wetland Wildlife Habitat Management (644)
Plants – Wildfire hazard from biomass accumulation	Brush Management (314); Forest Stand Improvement (666); Firebreak (394); Fuel Break (383); Herbaceous Weed Treatment (315); Prescribed Grazing (528); Woody Residue Treatment (384)

Resource Concern	Conservation Activities to Address Concern
Animals	
Animals - Terrestrial habitat for wildlife and invertebrates; Aquatic habitat for fish and other organisms	Access Control (472); Aquatic Organism Passage (396); Brush Management (314); Conservation Cover (327); Early Successional Habitat Development/Management (647); Field Border (386); Forage Harvest Management (511); Forest Stand Improvement (666); Hedgerow Planting (422); Forage and Biomass Planting (512); Integrated Pest Management (595); Prescribed Burning (338); Prescribed Grazing (528); Range Planting (550); Restoration and Management of Rare and Declining Habitats (643); Riparian Forest Buffer (391); Riparian Herbaceous Cover (390); Shallow Water Development and Management (646); Structures for Wildlife (649); Stream Habitat Improvement and Management (395); Tree/Shrub Establishment (612); Upland Wildlife Habitat Management (645); Watering Facility (614); Wetland Creation, Enhancement and Restoration (658, 659, 657); Wetland Wildlife Habitat Management (644); Wildlife Habitat Planting (420); Windbreak/Shelterbelt Establishment (380)
Animals - Feed and forage imbalance; Inadequate livestock shelter; Inadequate livestock water quantity, quality and distribution	Brush Management (314); Feed Management (592); Fence (382); Forage Harvest Management (511); Heavy Use Area Protection (561); Nutrient Management (590); Forage and Biomass Planting (512); Integrated Pest Management (595); Livestock Shelter Structure (576); Pipeline (516); Pond (378); Prescribed Burning (338); Prescribed Grazing (528); Pumping Plant (533); Range Planting (550); Silvopasture Establishment (381); Spring Development (574); Trails and Walkways (575); Watering Facility (614); Windbreak/Shelterbelt Establishment (380)
Energy	
Energy – Energy efficiency of farming/ranching practices and field operations	Conservation Crop Rotation (328); Cover Crop (340); Field Operations Emissions Reduction (376); Irrigation Water Management (449); Nutrient Management (590); Pumping Plant (533); Residue and Tillage Management (329, 345)
Energy – Energy efficiency of equipment and facilities	Building Envelope Improvement (672); Combustion System Improvement (372); Farmstead Energy Improvement (374); Lighting System Improvement (670); Pumping Plant (533); Tree/Shrub Establishment (612); Windbreak/Shelterbelt Establishment and Renovation (380, 650)

Appendix C: Examples of CSP Enhancements

Note: Over 200 enhancements were available to CSP participants in FY 2019. Similar enhancements were used in previous fiscal years. More complete lists of enhancements available in FY 2017–2020 can be viewed from links on this web page:

<https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/financial/csp/?cid=nrcseprd1288624>

Enhancements for FYs 2015 and 2016 can be viewed here:

<https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/financial/csp/?cid=nrcseprd1289238>

Appendix C of the 2009 CSP Programmatic EA provided examples of enhancements used between 2008 and 2014 and can be viewed here:

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/ecosciences/ec/?cid=nrcseprd387616>

FY 2019 Crop Enhancements

Resource Concern	Enhancement	Associated Practice (Code)
Soil	<ol style="list-style-type: none"> 1) Establish no till system to reduce sheet and rill erosion soil loss. 2) Establish a Resource Conserving Crop Rotation 3) Establish a no till system to increase soil health and soil organic matter content. 4) Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increase soil organic matter. 5) Establish a cover crop mix that includes plants with both fibrous root and deep-rooted systems. 6) Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axle loads to minimize soil compaction. 	<ol style="list-style-type: none"> 1) Residue & Tillage Management (329) 2) Conservation Crop Rotation (328) 3) Cover Crop (340) 4) Controlled Traffic Farming (334)
Water	<ol style="list-style-type: none"> 1) Reduce risks of nutrient losses to surface water by utilizing precision agriculture technologies to plan and apply nutrients 2) Establish a cover crop mix to take up excess soil nutrients. 3) Increase riparian forest buffer width to reduce sediment loading 4) Use Integrated Pest Management PAMS techniques (prevent, avoid, monitor, and suppress) to reduce risk of pesticides in surface water and reducing the potential for delivery of chemicals into water bodies. 5) Advanced automated irrigation water 	<ol style="list-style-type: none"> 1) Nutrient Management (590) 2) Cover Crop (340) 3) Riparian Forest Buffer (391) 4) Integrated Pest Management (595)

Resource Concern	Enhancement	Associated Practice (Code)
	management: <ul style="list-style-type: none"> • Install and monitor soil moisture or water leveling equipment • Use data loggers to monitor soil moisture or water level. • Keep records to calculate daily water balance and forecast future irrigation. • Automated intermittent flood irrigation of rice 6) Complete pumping plant evaluation for all pumps on a farm 7) Establish a no till system to increase plant-available moisture.	5) Irrigation Water Management (449) 6) Irrigation Water Management (449) 7) Residue & Tillage Management (329)
Air	1) Establish no till system to reduce tillage induced particulate matter. 2) Modify tillage and/or harvest operations to reduce particulates by at least 20 % below the required levels. 3) Manage nutrient applications to reduce emissions of greenhouse gases 4) Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch	1) Residue & Tillage Management (329) 2) Field Operations Emissions Reductions (376) 3) Nutrient Management (590) 4) Mulching (484)
Plants	1) Establish a cover crop mix to suppress excessive weed pressures and break pest cycles. 2) Plant food-producing trees and shrubs for wildlife or human consumption within windbreaks, alley cropping, multi-story cropping, silvopasture systems, and/or riparian forest buffers.	1) Cover Crop (340) 2) Tree/Shrub Establishment (612)

Resource Concern	Enhancement	Associated Practice (Code)
Animals	<ol style="list-style-type: none"> 1) Seed or plug nectar and pollen producing plants in non-cropped areas 2) Enhance field borders to increase wildlife habitat continuity along the edge(s) of a field 3) Flexible placement of wood in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species 4) Consolidate existing stream crossings to reduce impacts to stream habitat 5) Reduce of attractants to human-subsidized predators in sensitive wildlife species habitat 6) Renovate small, shallow wetland sites to encourage water to remain seasonally. 7) Extend retention of captured rainfall to provide enhanced cover and shelter for late winter habitat for migratory waterfowl and shorebirds. 	<ol style="list-style-type: none"> 1) Conservation Cover (327) 2) Field Border (386) 3) Stream Habitat Improvement & Management (395) 4) Stream Crossing (578) 5) Upland Wildlife Habitat Management (645) 6) Shallow Water Development & Management (646)
Energy	<ol style="list-style-type: none"> 1) Install Variable Frequency Drive(s) (VFD) on Pumping Plant (533) 2) Switch the fuel source for pumps to a renewable source (wind, solar, geothermal) 3) Reduce tillage operations to reduce total energy consumption by at least 25% 	<ol style="list-style-type: none"> 1) Farmstead Energy Improvement (374) 2) Residue & Tillage Management (345)

FY 2019 Pasture Enhancements

Resource Concern	Enhancement	Associated Practice (code)
Soil	<ol style="list-style-type: none"> 1) Establish adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide for reduced soil erosion, improving soil health. 2) Grazing management employed will provide vegetative cover and density needed to protect sensitive areas such as sinkholes, streams, and highly erodible areas. 3) 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. 	<ol style="list-style-type: none"> 1) Forage and Biomass Planting (512) 2) Prescribed Grazing (528)
Water	<ol style="list-style-type: none"> 1) Increase stream shading for stream temperature reduction. 2) Manage livestock access to streams, ditches, and other waterbodies to reduce nutrients in surface water. 3) 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. 4) Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in surface water and reduce the potential for delivery of chemicals into water bodies. 	<ol style="list-style-type: none"> 1) Riparian Forest Buffer (391) 2) Access Control (472) 3) Prescribed Grazing (528) 4) Integrated Pest Management (595)

Resource Concern	Enhancement	Associated Practice (code)
Air	<ol style="list-style-type: none"> 1) Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce ozone precursor emissions related to pesticides. 2) Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands. 	<ol style="list-style-type: none"> 1) Integrated Pest Management (595) 2) Tree/Shrub Establishment (612)
Plants	<ol style="list-style-type: none"> 1) Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. 2) Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions. 3) Plant trees and shrubs that are of cultural significance, such as those species utilized by Tribes in traditional practices, medicinal plants, species used in basket-making, etc. 4) Establish a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock and including a purpose of enhancing wildlife habitat. 5) Establish adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures. 6) Manage 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. 	<ol style="list-style-type: none"> 1) Brush Management (314) 2) Herbaceous Weed Treatment (315) 3) Tree/Shrub Establishment (612) 4) Silvopasture Establishment (381) 5) Forage and Biomass Planting (512) 6) Prescribed Grazing (528)

Resource Concern	Enhancement	Associated Practice (code)
Animals	<ol style="list-style-type: none"> 1) Establish adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for pollinators and forage and other habitat values for wildlife and livestock, particularly at times when targeted nectar, forage supply and quality, cover, and shelter are not available in other pastures. 2) Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer. 3) Flexible placement of wood (unanchored/unpinned) in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species and natural stream processes. 4) The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such as way and time frames so as optimize both forage yield/quality and wildlife cover and shelter 5) Grazing management employed will provide plant structure, density and diversity needed for the desired wildlife species of concern. 6) Maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds. 7) Pond rehabilitation, buffer, and watershed management actions are taken to improve habitat for native species of fish, amphibians, and shorebirds 8) Retrofit or construct fences that provide a means to control movement of animals, people, and vehicles, but minimizes wildlife movement impacts. 	<ol style="list-style-type: none"> 1) Forage and Biomass Planting (512) 2) Riparian Herbaceous Cover (390) 3) Stream Habitat Improvement & Management (395) 4) Forage Harvest Management (511) 5) Prescribed Grazing (528) 6) Wetland Wildlife Habitat Management (644) 7) Fishpond Management (399) 8) Fence (382)
Energy	<ol style="list-style-type: none"> 1) Switch the fuel source for the pump motor(s) indicated in the energy audit to a renewable source (wind, solar, geothermal, etc.) 2) Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in an energy audit. 	<ol style="list-style-type: none"> 1) Farmstead Energy Improvement (374)

FY 2019 Range Enhancements

Resource	Enhancement	Associated Practice (code)
Soil	1) Grazing management employed will provide vegetative cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations that cannot tolerate plant defoliation.	1) Prescribed Grazing (528)
Water	1) Riparian area tree canopy cover density is increased, and the extent of the forested riparian area is increased to provide greater stream shading. 2) Manage livestock access to streams, ditches, and other waterbodies to reduce nutrients in surface water. 3) 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.	1) Riparian Forest Buffer (391) 2) Access Control (472) 3) Prescribed Grazing (528)
Air	1) Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands.	1) Tree/Shrub Establishment (612)
Plants	1) Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. It will be designed to provide plant structure, density and diversity needed to meet those habitat objectives. 2) Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions. 3) Patch burn grazing to apply prescribed fires on portions of an identified grazing unit at different times of the year to allow grazing animals to select fresh regrowth to graze creating a mosaic of vegetation structures and diversity that will maintain or enhance the wildlife habitat desired for the identified wildlife species and maintain livestock production.	1) Brush Management (314) 2) Herbaceous Weed Treatment (315) 3) Prescribed Burning (338)

Resource	Enhancement	Associated Practice (code)
Animals	<ol style="list-style-type: none"> 1) Retrofit or construct fences that provide a means to control movement of animals, people, and vehicles, but minimizes wildlife movement impacts. 2) Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer. 3) Where an existing riparian forest buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock to increase the functional width of the buffer. 4) Grazing management employed will provide for the capacity of seasonally valuable plant structure, density and diversity needed or the desired wildlife species of concern. 5) A prescribed grazing plan that includes 18-month (or longer) deferment 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 for a period of time. 	<ol style="list-style-type: none"> 1) Fence (382) 2) Riparian Herbaceous Cover (390) 3) Riparian Forest Buffer (391) 4) Prescribed Grazing (528)

FY2019 Forest Enhancements

Resource Concern	Enhancement	Practice (code)
Soil	<ol style="list-style-type: none"> 1) Stream corridor bank vegetation components are established to provide additional stream corridor bank stability. 2) Adopts guidelines for sustaining soil quality and wildlife habitat on sites where pine straw raking is currently practiced. 	<ol style="list-style-type: none"> 1) Streambank and shoreline protection (580) 2) Forest Stand Improvement (666)
Water	<ol style="list-style-type: none"> 1) Riparian area tree canopy cover density is increased, and the extent of the forested riparian area is increased to provide greater stream shading. 2) Manage livestock access to streams, ditches, and other waterbodies to reduce nutrients or pathogens in surface water. 3) Convert loblolly and slash pine plantations to longleaf pine to retain soil moisture. 	<ol style="list-style-type: none"> 1) Riparian Forest Buffer (391) 2) Access Control (472) 3) Forest Stand Improvement (666)
Air	<ol style="list-style-type: none"> 1) Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands. 2) Use forest management techniques to maintain and increase on-site carbon storage, including applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic material. 	<ol style="list-style-type: none"> 1) Tree/Shrub Establishment (612) 2) Forest Stand Improvement (666)

Resource Concern	Enhancement	Practice (code)
Plants	<ol style="list-style-type: none"> 1) Establish trees and/or shrubs to restore elements of plant diversity lost through past diseases or improper management. For example, disease-resistant varieties of elm and chestnut can be established to restore the ecological functions of American elm and American chestnut. 2) Restoration of sensitive coastal vegetative communities 3) Reduce forest stand density to create open forest conditions with a low basal area which promotes health and vigor of residual trees. The open stand structure allows sunlight to reach the forest floor and stimulates the growth of understory vegetation to provides visual appeal, lower risk of wildfire, and provide habitat for wildlife species. 	<ol style="list-style-type: none"> 1) Tree/Shrub Establishment (612) 2) Restoration & Management of Rare or Declining Habitats (643) 3) Forest Stand Improvement (666)
Animals	<ol style="list-style-type: none"> 1) Seed or plug nectar and pollen producing plants in noncropped areas such as field borders, vegetative barriers, contour buffer strips, grassed waterways, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers. 2) Consolidate existing stream crossings into fewer crossings to reduce impacts to stream habitat. 3) Improve wildlife habitat through creation and retention of snags, den trees, forest stand structural diversity, and coarse woody debris on the forest floor, to provide cover/shelter for native wildlife species. 4) Short return interval prescribed burning is used to regenerate desirable tree species, improve the condition of fire-adapted plants and native herbaceous vegetation, improve wildlife food supply, create wildlife habitat (snags and den/cavity trees), limit encroachment of competing vegetation including non-native species, and reduce the future risk of damage from intense, severe wildfires. 	<ol style="list-style-type: none"> 1) Conservation Cover (327) 2) Stream Crossing (578) 3) Forest Stand Improvement (666) 4) Prescribed Burning (338)