Rangeland Assessments in Alaska

Wasilla, AK

July 25-27, 2018

First – Soils/ecological sites of the area
Second- Talk to the producer

* **How do they manage their range?**
  - Are they rotating?
  - How do they decide its time to move the animals?
  - What kind of animals, how many, average weights,
  - What are the needs of the animals (fencing, social, space),
  - When do they turn them in, when do they stop grazing for the season
  - What kinds of problems or challenges are they having,
  - What do they want their rangeland to look like,
  - Are they supplemental feeding, and if so with what, and how much.
  - What is the history of their range?
* **What is the primary purpose of the rangeland?**
  - Forage, exercise, aesthetics, health

Assessments / data to gather

- Utilization
- Apparent Trend
- Similarity Index
- Production
- Rangeland Health

Rangeland Resource Evaluations

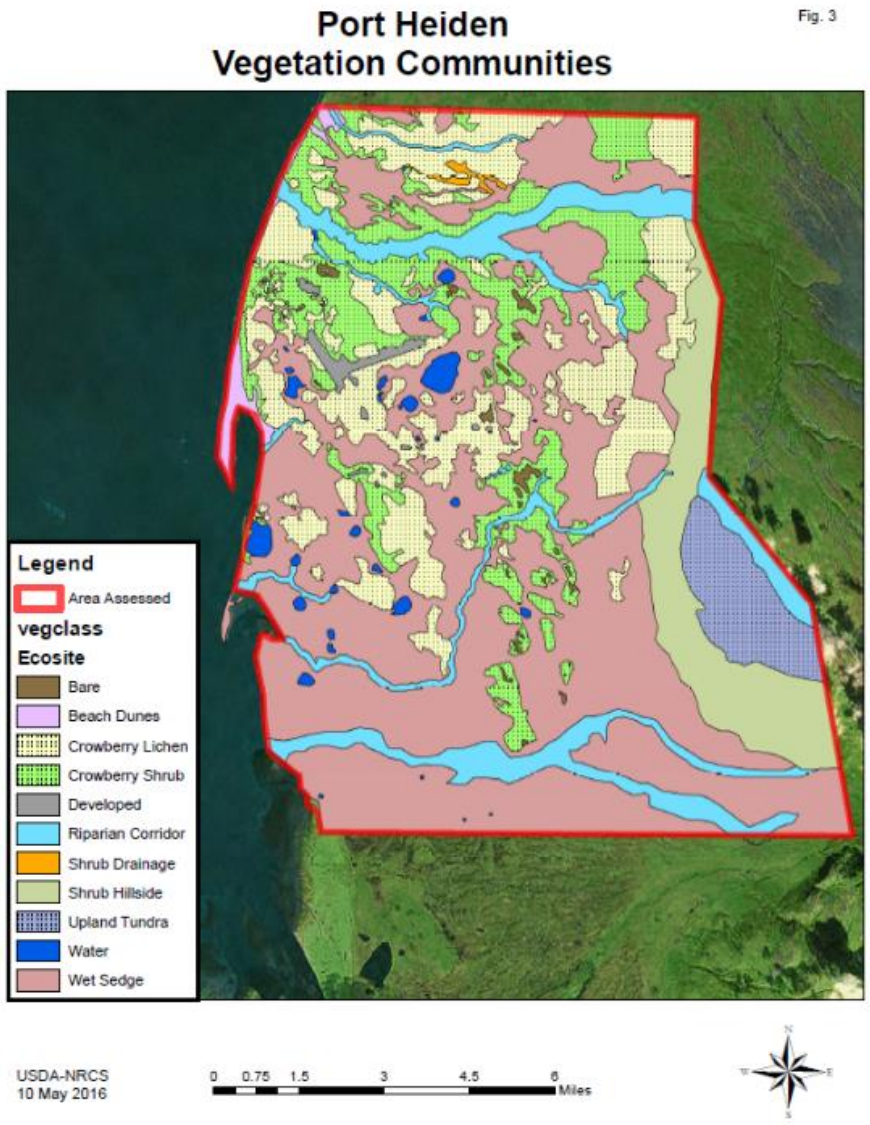
Tools you need:

- ✓ Ecological Site Description
- ✓ Ecological Site Reference Sheet
- ✓ Field Notebook
- ✓ Plant knowledge & Identification skills
- ✓ Apparent Trend Data Sheet
- ✓ Similarity Index Data Sheet
- ✓ Shovel
- ✓ Ruler

Initial Data Collection

- Species
- Productivity (#/ac)
- Cover by species / bare ground

Start with Ecological Sites



USDA United States Department of Agriculture

Similarity Index

AK-ECS-528-2
July 2004

Worksheet for Determining Similarity Index

Client ______________ Ecological Site ______________

Location ______________ Reference vegetation state ______________

Date ______________ Completed by ______________

A	B	C	D	E	F	G	H	I	J
Species Name	Green wt. pounds	% dry weight 1/	% current growth ungrazed 1/	% growth curve completed 1/	% of normal production 1/	Reconstruction Factor C / (D)(E)(F)	Reconstructed present weight	Pounds in reference state	Pounds allowable

K. Total normal annual production in reference vegetation state (from ecological site description).

L. Total pounds of allowable present (total of pounds in column J).

M. Similarity index (L divided by K x 100 = M)

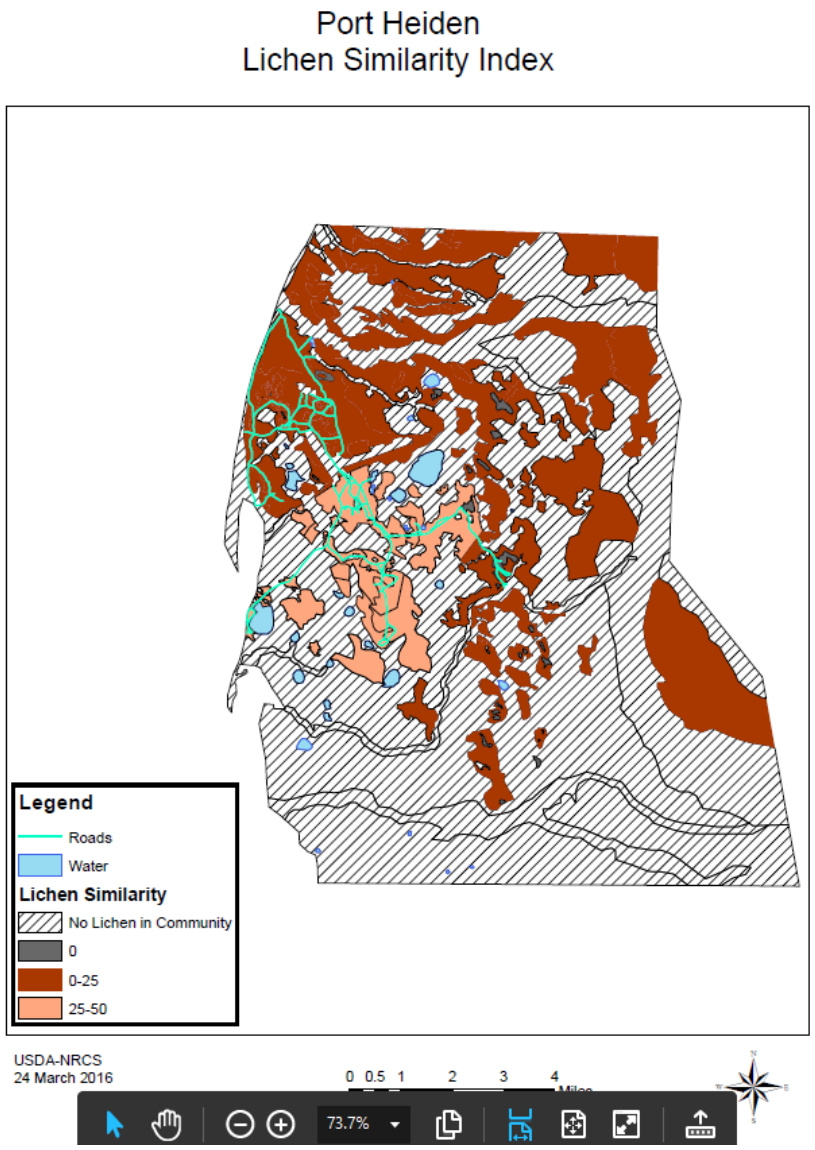
1/ Express all percents as decimal values (Example: 60% = .6).

AK-ECS-528-2
July 2004

Instructions for Worksheet for Determining Similarity Index

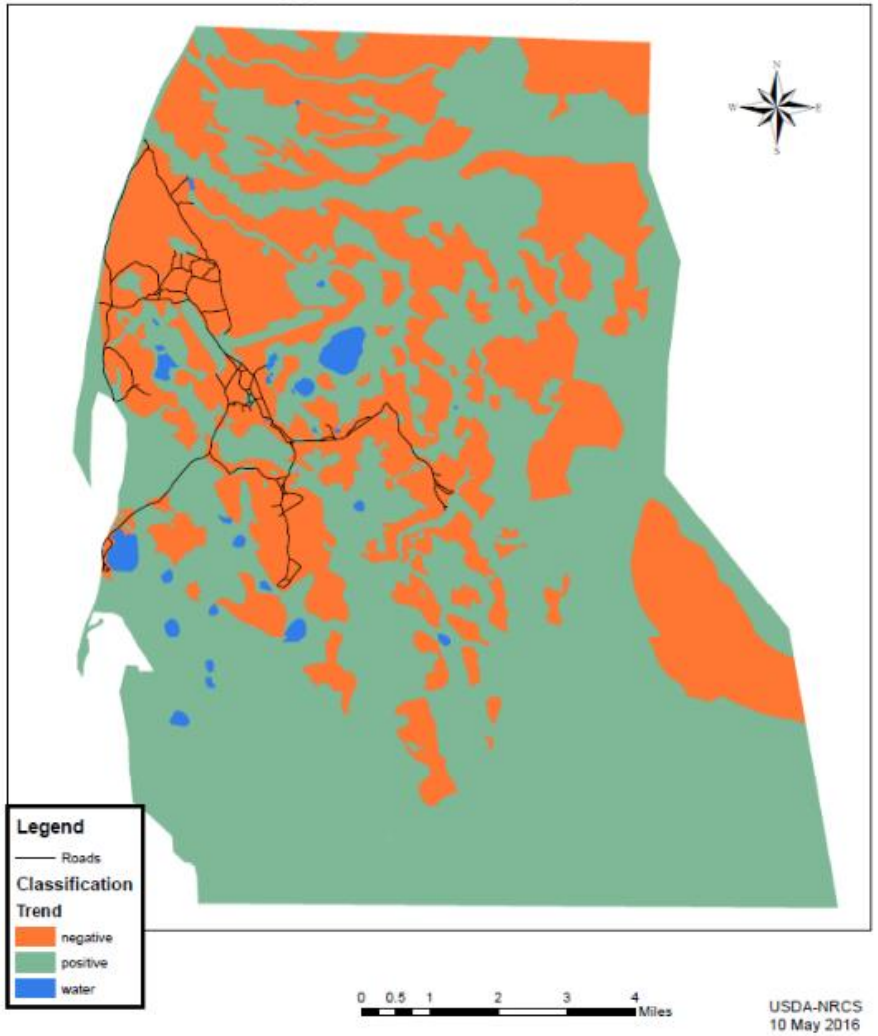
A. Species name	Enter the common or scientific name of the plant species.
B. Green wt. pounds	Enter the fresh clipped weight of each species.
C. Percent dry weight	Enter the percent air dry weight or oven dry weight as a decimal value.
D. Percent current growth unqrazed	Enter the estimated percent (as a decimal value) of the current growth that has not been removed by grazing or harvest.
E. Percent growth curve completed	Enter the percent (as a decimal value) of the current years growth for each species that should normally have occurred by the date of this determination.
F. Percent of normal production	Enter an estimation of the current years forage growth in comparison to normal expressed as a percent (as a decimal value) of normal. Example: .9 means the year's production is 90% of normal or 10% below normal. 1.1 is 110% of normal or 10% above normal.
G. Reconstruction factor	This factor is calculated by dividing (C) Percent dry weight by the product obtained by multiplying (D) Percent current growth ungrazed times (E) Percent growth curve completed times (F) Percent of normal production. (C / D x E x F = G)
H. Reconstructed present weight	This value is calculated by multiplying (B) Green weight in pounds by (G) the Reconstruction factor. (B x G = H)
I. Pounds in reference vegetation state	Enter the pounds for each plant species as shown in the appropriate reference vegetation state in the ecological site description.
J. Pounds allowable	Enter the lesser of (H) Reconstructed present weight or (I) pounds. No more than the pounds in the reference vegetation state plant community may be counted in determining similarity index.
K. Total normal annual production in reference vegetation state	This is the total normal product of all plants shown in the appropriate reference vegetation state plant community description of the ecological site description.
L. Total pounds of allowable present	This is the total of all weight shown in column (J). It is all the weight that is allowed to count toward determining similarity index.
M. Similarity index	This is calculated by dividing (L) Total pounds of allowable present by (K) total Normal annual production and multiplying by 100 to express it as a percent. (L / K x 100 = M)

Similarity Index



Port Heiden
Apparent Trend Map

Fig. 5



NRCS
Natural Resources Conservation Service

Prescribed Grazing
Apparent Trend Worksheet AK-ECS-528-5 July 2004

Client: _____ Location: _____ Completed by: _____ Date: _____

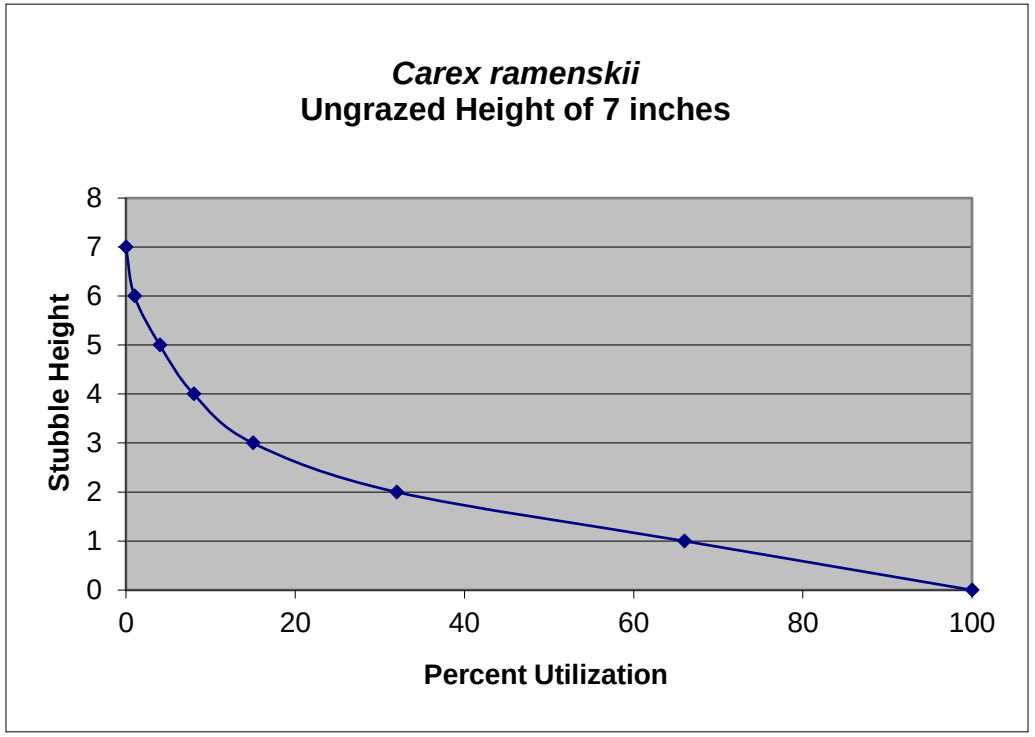
Considering the potential for this site, rate the following by giving each item a rating of 4 to 0. Interpolate between definition of 4 and 0 for ratings 3, 2, and 1.
Historic Plant Community: _____ Desired Plant Community: _____

Long Term Indicators of Trend	4	3	2	1	0
Composition Changes: There is strong evidence that past management of grazing animals, environmental and/or climatic conditions are causing plant composition changes, plant succession, towards the historic plant community, or some other desired plant community or vegetation state.----(4) There is strong evidence that past disturbances such as continued close grazing by grazing animals, severe or prolonged drought, abnormally high precipitation, exotic species invasion, or unnatural-burning frequencies, have caused plant composition changes, plant succession, away from the historic plant community or some other desired plant community or vegetation state.----(0)					
Abundance of Seedlings and Young Plants: There are a significant number of seedlings and young plants indigenous to the site, plants of all age levels, with healthy tillers, rhizomes and stolons----(4) There are very few or no seedlings and young plants indigenous to the site, single aged level plants, with unhealthy tillers, rhizomes and stolons. Plants indigenous to site are not reproducing----(0)					
Plant Residue: Plant residue has progressively accumulated to the level that can be expected for the specific ecological site, plant species, and climate----(4) Little or no plant residue has progressively accumulated to the level that can be expected for the specific ecological site, plant species, and climate----(0)					
Plant Vigor: Plants indigenous to the site are healthy, robust, well rooted, rhizomes or stolons are long and many; seed heads are large and numerous----(4) Plants indigenous to the site are dying, shallow rooted, rhizomes or stolons are short and few. There are few seed heads or none at all. Seed heads are stunted if present----(0)					
Condition of the Soil Surface: There are no visible signs of accelerated erosion, past erosion is being healed by plants indigenous to the site. Bare ground, soil crusting, stone cover, plant hummocking, or soil movement are what is expected for the site----(4) Accelerated erosion is very obvious and past erosion is not being healed by plants indigenous to the site. Bare ground, soil crusting, stone cover, plant hummocking, or soil movement are not what is expected for the site----(0)					

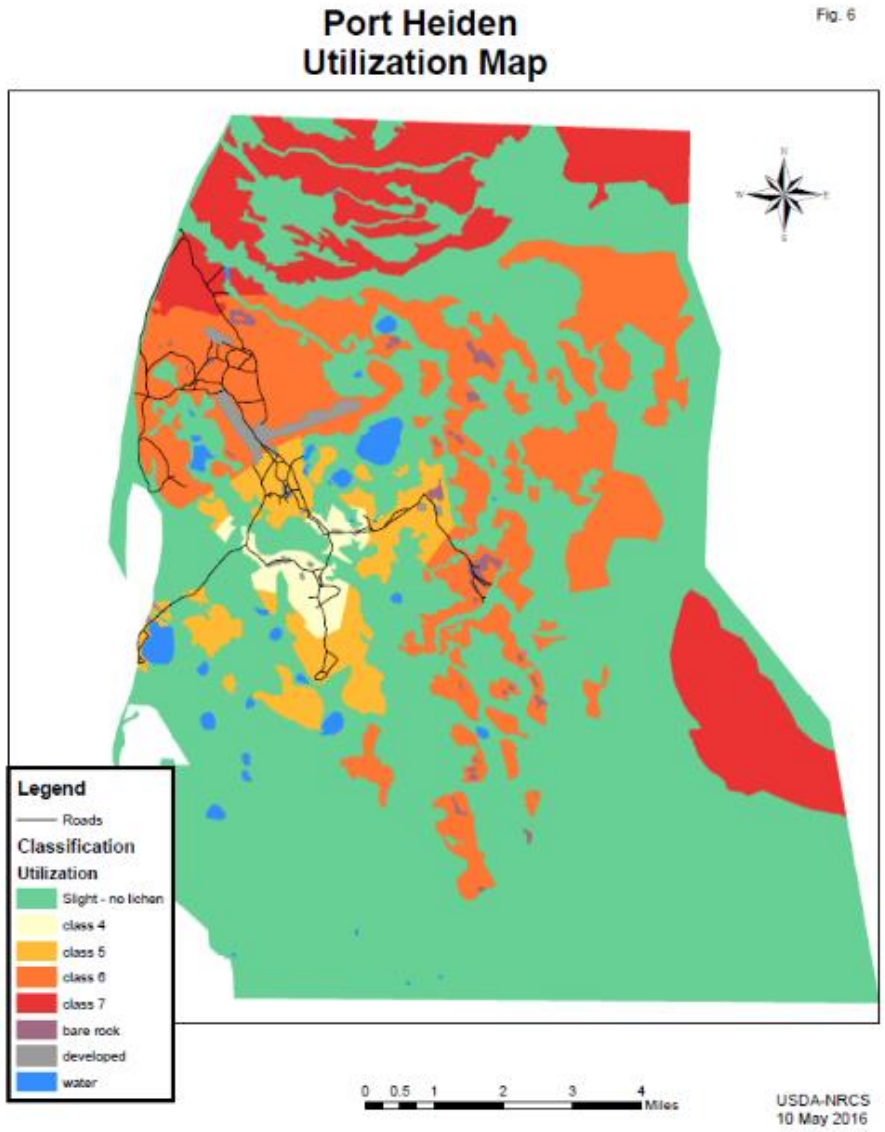
Overall Trend Rating(s): Check the appropriate kind of trend and rating, toward or away from historic climax or planned plant community.

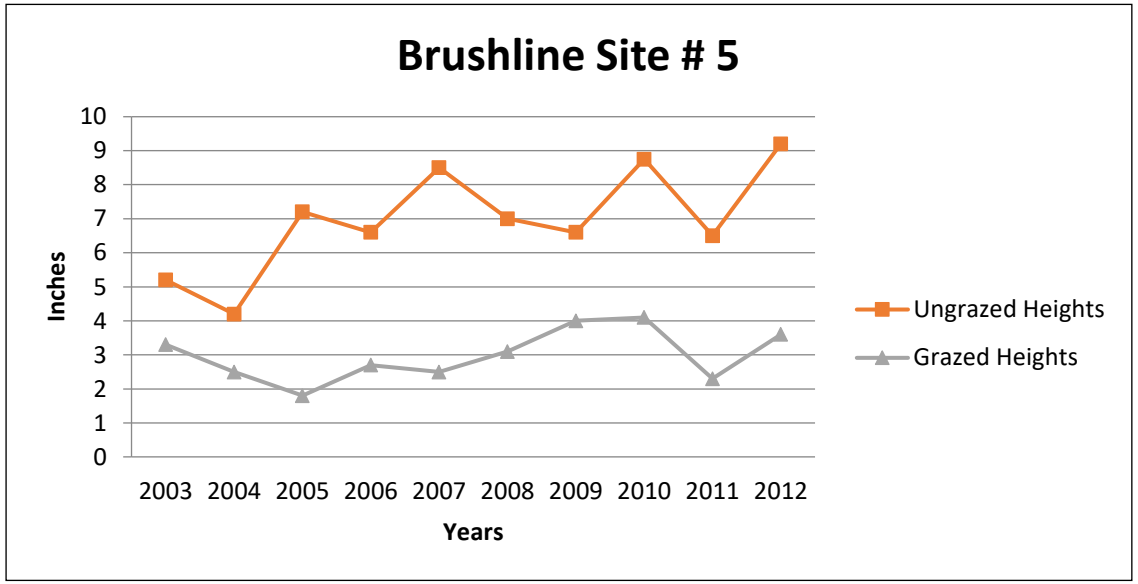
Range Trend:	Toward	☐	Not Apparent	☐	Away from ☐
Planned Trend:	Positive	☐	Not Apparent	☐	Negative ☐

Utilization %



Half the height does not equal half the biomass.





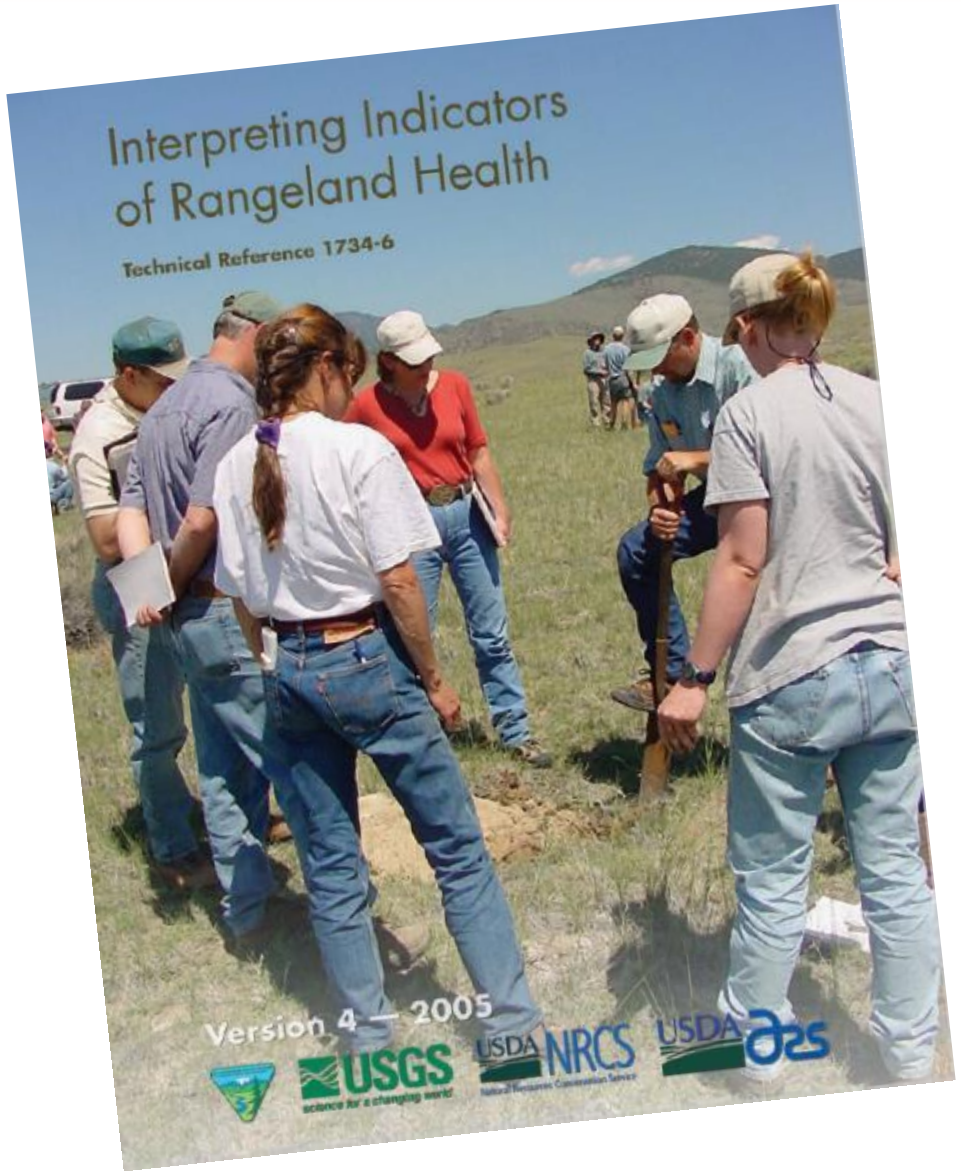
Variability in productivity will occur from year to year.

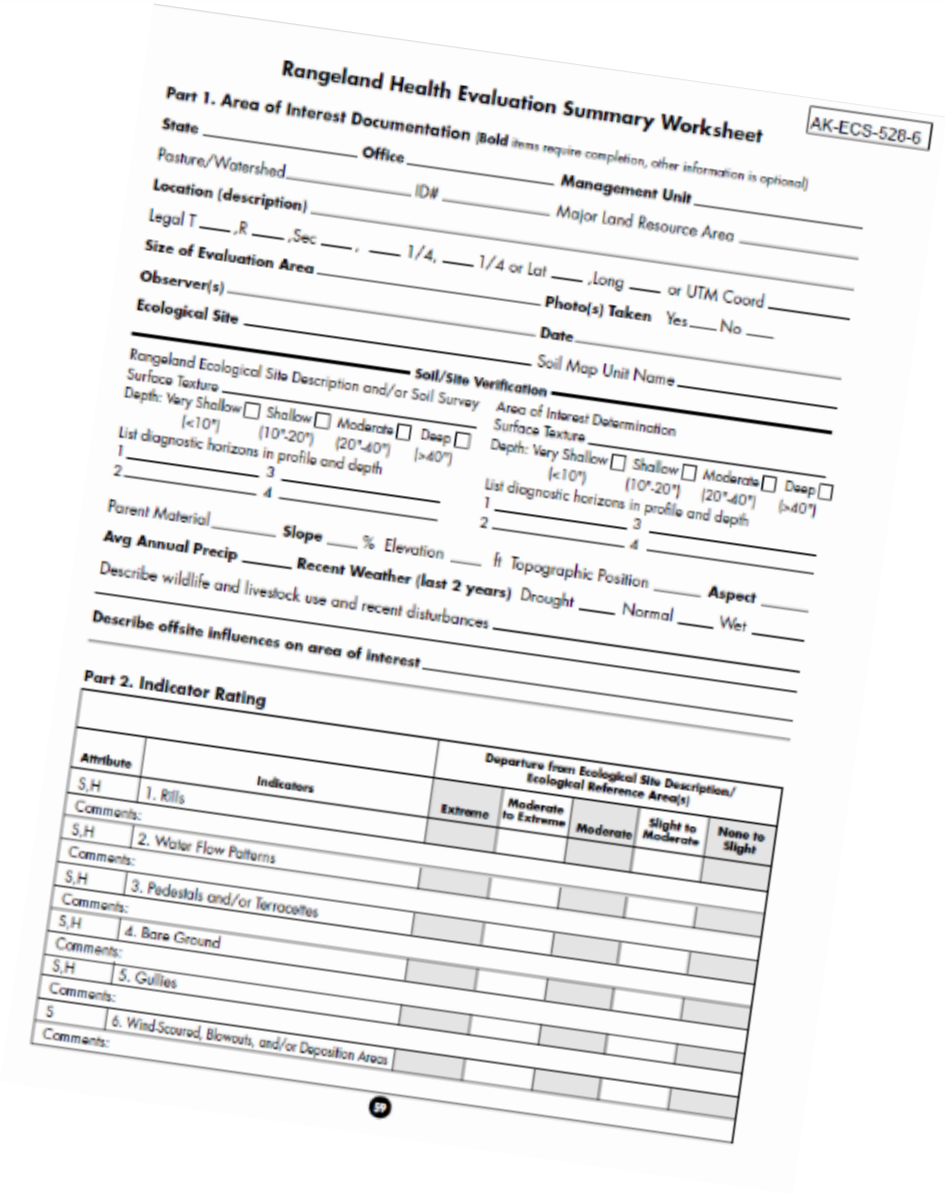
Exclosures for ungrazed height comparisons are critical for accurate utilization assessments.

Rangeland Health Assessment

17 Indicators to Assess

- Rills
- Water flow patterns
- Pedestals and/or Terracettes
- Bare ground
- Gullies
- Wind-scoured, blowouts, deposition areas
- Litter movement
- Soil surface resistance to erosion
- Soil surface loss or degradation
- Plant community composition and distribution
- Compaction layer
- Functional/ Structural groups
- Plant mortality
- Litter amount
- Annual production
- Invasive plants
- Reproductive capacity





Rangeland Health Evaluation Summary Worksheet AK-ECS-528-6

Part 1. Area of Interest Documentation (Bold items require completion, other information is optional)

State _____ **Office** _____ **Management Unit** _____

Pasture/Watershed _____ ID# _____ Major Land Resource Area _____

Location (description) _____

Legal T ___ ,R ___ ,Sec ___ , ___ 1/4, ___ 1/4 or Lat ___ ,Long ___ or UTM Coord _____

Size of Evaluation Area _____ **Photo(s) Taken** Yes___ No ___

Observer(s) _____ **Date** _____

Ecological Site _____ Soil Map Unit Name _____

Soil/Site Verification

Rangeland Ecological Site Description and/or Soil Survey

Surface Texture _____

Depth: Very Shallow ☐ (<10") Shallow ☐ (10"-20") Moderate ☐ (20"-40") Deep ☐ (>40")

List diagnostic horizons in profile and depth

1 _____ 3 _____

2 _____ 4 _____

Area of Interest Determination

Surface Texture _____

Depth: Very Shallow ☐ (<10") Shallow ☐ (10"-20") Moderate ☐ (20"-40") Deep ☐ (>40")

List diagnostic horizons in profile and depth

1 _____ 3 _____

2 _____ 4 _____

Parent Material _____ **Slope** ___ % Elevation ___ ft Topographic Position _____ **Aspect** _____

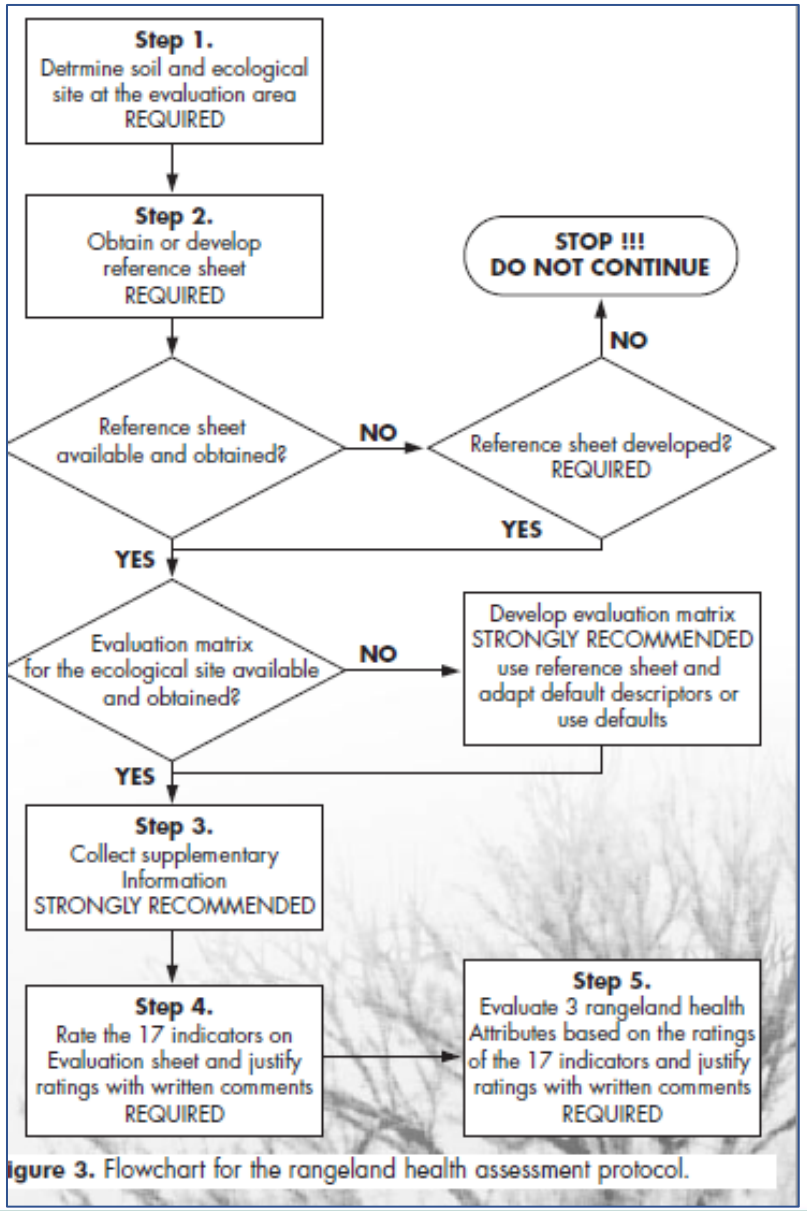
Avg Annual Precip _____ **Recent Weather (last 2 years)** Drought ___ Normal ___ Wet ___

Describe wildlife and livestock use and recent disturbances _____

Describe offsite influences on area of interest _____

Part 2. Indicator Rating

Attribute	Indicators	Departure from Ecological Site Description/ Ecological Reference Area(s)				
		Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
S,H	1. Rills					
Comments:						
S,H	2. Water Flow Patterns					
Comments:						
S,H	3. Pedestals and/or Terracettes					
Comments:						
S,H	4. Bare Ground					
Comments:						
S,H	5. Gullies					
Comments:						
S	6. Wind-Scoured, Blowouts, and/or Deposition Areas					
Comments:						



igure 3. Flowchart for the rangeland health assessment protocol.

Reference Sheet must be developed to go through the Rangeland Health Protocol. But it isn't – so, call the State Grazing Specialist

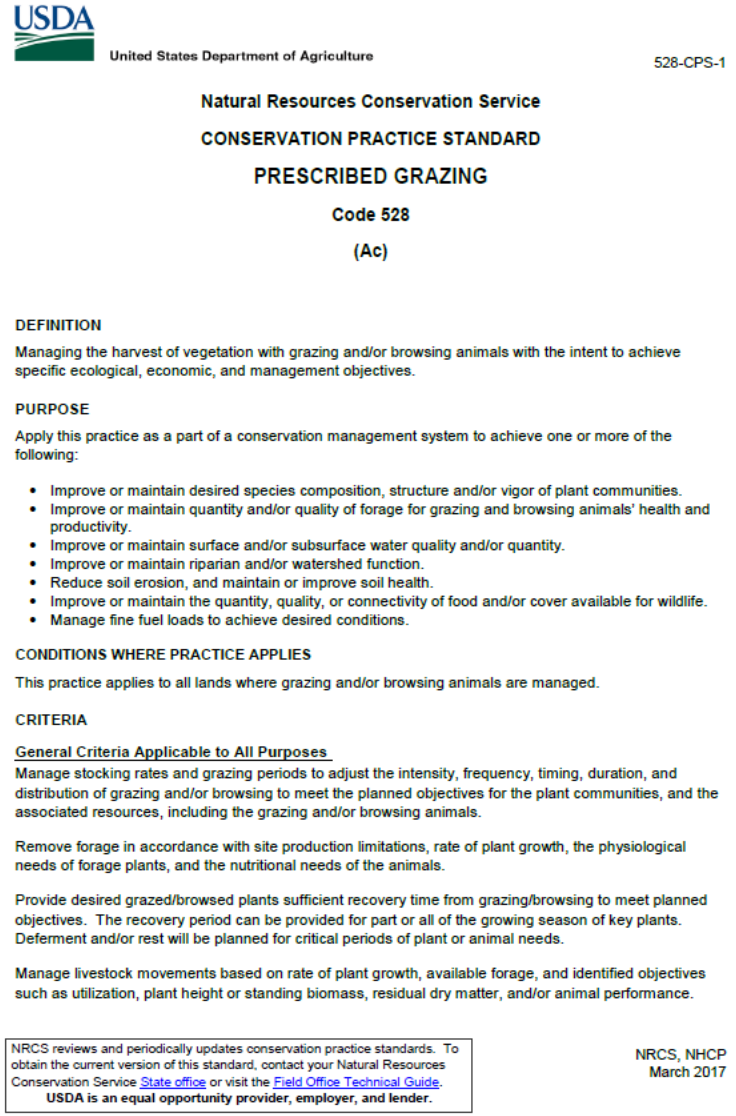
After your assessments:

What are the issues?

How can you address them to help the producer meet their goals?

Planning for a Grazing Management Plan / Prescribed Grazing

Get to know the Practice Standard! 528 Prescribed Grazing



USDA United States Department of Agriculture

528-CPS-1

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

PRESCRIBED GRAZING

Code 528

(Ac)

DEFINITION

Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological, economic, and management objectives.

PURPOSE

Apply this practice as a part of a conservation management system to achieve one or more of the following:

- Improve or maintain desired species composition, structure and/or vigor of plant communities.
- Improve or maintain quantity and/or quality of forage for grazing and browsing animals' health and productivity.
- Improve or maintain surface and/or subsurface water quality and/or quantity.
- Improve or maintain riparian and/or watershed function.
- Reduce soil erosion, and maintain or improve soil health.
- Improve or maintain the quantity, quality, or connectivity of food and/or cover available for wildlife.
- Manage fine fuel loads to achieve desired conditions.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where grazing and/or browsing animals are managed.

CRITERIA

General Criteria Applicable to All Purposes

Manage stocking rates and grazing periods to adjust the intensity, frequency, timing, duration, and distribution of grazing and/or browsing to meet the planned objectives for the plant communities, and the associated resources, including the grazing and/or browsing animals.

Remove forage in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants, and the nutritional needs of the animals.

Provide desired grazed/browsed plants sufficient recovery time from grazing/browsing to meet planned objectives. The recovery period can be provided for part or all of the growing season of key plants. Deferment and/or rest will be planned for critical periods of plant or animal needs.

Manage livestock movements based on rate of plant growth, available forage, and identified objectives such as utilization, plant height or standing biomass, residual dry matter, and/or animal performance.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide.
USDA is an equal opportunity provider, employer, and lender.

NRCS, NHCP
March 2017

After your assessments:

Calculate your forage needs by animal(s)

animal	weight body weight	deer body weight	intake % percent body wt	deer percent body wt	intake daily intake requirement	deer daily intake requirement	effeciency percent forage loss	forage required for 1 day	Deer Forage Required Per Day
moose	600		2.60%		15.6		8%	17	
bison	1200		2.60%		31.2		25%	39	
elk/deer	300	200	3.20%	4.10%	9.6	8.2	5%	10	8.6
bison	1200		2.60%		31.2		25%	39	

After your assessments:

Calculate your forage available by field

Field 12	7 ac					
Site #	Site Name	Acreage	Forage # available/ac	Forage Available	Browse # available/ac	Browse Available
2	Alder - Willow	3	7.5	22.5	375	1125
4	Annual Rye - Carex	2.3	788	1812.4		
5	Sedge - Hairgrass	1.1	862	948.2		
8	Wildrye - Tidal	0.3	1348	404.4		
TOTAL		6.7		3187.5		1125

After your assessments:

Balance your forage

Animal Units of Forage Available							
Months							
	MAY	JUN	JUL	AUG	SEP	OCT	N

NRCS Natural Resources Conservation Service

Prescribed Grazing
Livestock, Forage, and Feed Worksheet AK-ECS-528-4 July 2004

Client: Location: Completed by: Date:

Livestock Inventory

				Animal Units of Forage Needed Months											
Livestock/Wildlife	Planned Number	AU Equiv.	Total AU's	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total AUM's
Totals																

Forage & Feed Inventory

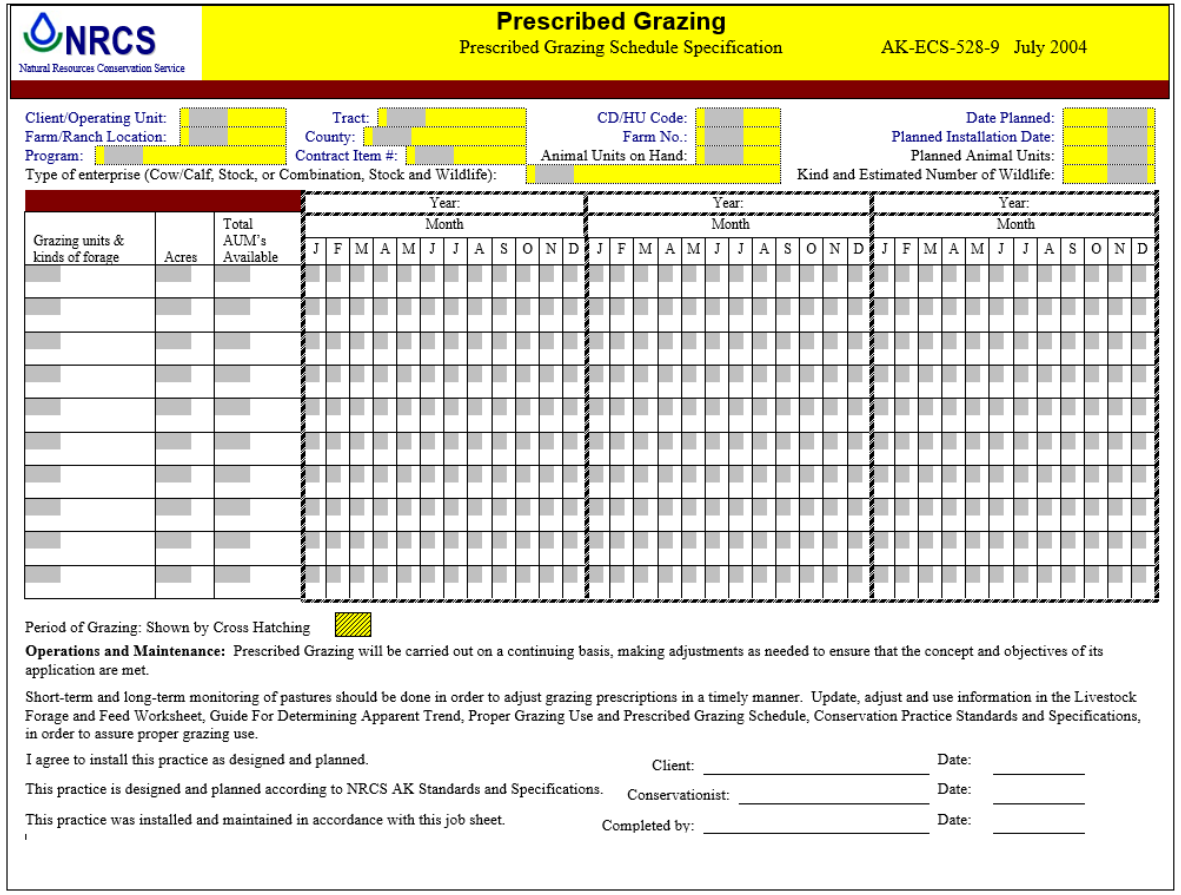
						Animal Units of Forage Available Months											
Pasture # & kind of forage or feed	Acres	Total AUM's	Trend	Adj Fact	Adj Total AUM's	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Totals																	

Livestock/Feed/Forage Balance

	Total AUM's	Months JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Total forage available (Adjusted. AUM's)													
Total forage needs (AUM's)													
Difference (=) or (-) (AUM's)													

After your assessments:

Schedule & document the rotation



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Prescribed Grazing
Prescribed Grazing Schedule Specification AK-ECS-528-9 July 2004

Client/Operating Unit: Tract: CD/HU Code: Date Planned:
Farm/Ranch Location: County: Farm No.: Planned Installation Date:
Program: Contract Item #: Animal Units on Hand: Planned Animal Units:
Type of enterprise (Cow/Calf, Stock, or Combination, Stock and Wildlife): Kind and Estimated Number of Wildlife:

Grazing units & kinds of forage	Acres	Total AUM's Available	Year: Month J F M A M J J A S O N D	Year: Month J F M A M J J A S O N D	Year: Month J F M A M J J A S O N D

Period of Grazing: Shown by Cross Hatching

Operations and Maintenance: Prescribed Grazing will be carried out on a continuing basis, making adjustments as needed to ensure that the concept and objectives of its application are met.

Short-term and long-term monitoring of pastures should be done in order to adjust grazing prescriptions in a timely manner. Update, adjust and use information in the Livestock Forage and Feed Worksheet, Guide For Determining Apparent Trend, Proper Grazing Use and Prescribed Grazing Schedule, Conservation Practice Standards and Specifications, in order to assure proper grazing use.

I agree to install this practice as designed and planned. Client: _____ Date: _____

This practice is designed and planned according to NRCS AK Standards and Specifications. Conservationist: _____ Date: _____

This practice was installed and maintained in accordance with this job sheet. Completed by: _____ Date: _____

When Planning:

- Determine “turn in” “and turn out” dates on production / utilization

Utilization Specifications

Grazing may be non-controlled, extensive, or may employ a designed grazing system such as intensive, semi-intensive or rest rotation.[5] Numbers 1 and 2 of Appendix B contain utilization specifications for vascular plants (grass, sedges, herbaceous plants, shrub and trees). Number 3 contains utilization specifications for non-vascular plants such as lichens. Note: The percent utilization values below refer to current year’s growth unless specified differently.

Table 1. Vascular plant utilization specifications for non-controlled grazing or extensive grazing.

Plant Names or Category	Recommended utilization (percent)
During growing season	
Bluejoint reedgrass *(Calamagrostis canadensis)*	<30
Sedges (Carex spp)	<30
All other vascular plants	<50
Dwarf shrubs growing on alpine sites	<20
During dormant season	
Herbaceous vascular plants	<65
Deciduous woody plants	<70
Evergreen woody plants	<60
Dwarf shrubs growing on alpine sites	<25

Determine your initial stocking rate

Initial Stocking Rate - Extensive Management Kakaruk Range

This system would involve grazing in the eastern part of the range that is use class 2 or less. The suggested use of the live lichen biomass is 5%.

Use Class 1 and 2

Ecosite	Acreage	Lichen Production (#/ac)	% decrease	5% suggested Use	Available Forage
Dryas Limestone Slope	197	270	0	17	3,349
Lichen Meadow (Mountain)	5,937	1640	0	82	486,834
Lichen Tussock Tundra	22,901	995	0	49.75	1,139,325
Lichen Granitic Slope	49,182	1380	0	69	3,393,558

Entire lichen available for deer in unit (pounds) = 5,023,066

One deer consumes 1.5% of its body weight per day in winter

250 # animal = 3.75# consumed per day 116# / mo
70% =2.6# lichen
80%=3# lichen

Jan-80%	93#	April-70%	174#	July-50%	127#	Oct-80%	205#
Feb-80%	84#	May-50%	127#	Aug-70%	180#	Nov-80%	90#
Mar-70%	180#	June-50%	123#	Sep-70%	174#	Dec-80%	93#

One deer consumes 3.3% of its body weight per day in summer -

250 # animal = 8.25# feed consumed per day
50%=4.1# lichen 256# / mo
70% = 5.8# lichen
80% = 6.6# lichen

lichen consumed per deer per year= 1650 # 15% trampling = 248 #

Total lichen needed per deer per year = 1898 #

Total # lichen used per deer per year = 1,898

Animals supported = 2,647

Prescribed Grazing:

To meet prescribed grazing standards:

- Lower the number of animals *or*
- Increase the amount of land *or*
- Control the access to the range

If the producer is not meeting prescribed grazing standards, and cannot do one of these above options, they cannot meet the Prescribed Grazing practice standard.

For Planning Purposes:

- Have a contingency plan for forage emergencies

When Planning :

Determine Key area and Key species

6. Key grazing areas shall be identified on the conservation plan map using the following criteria:

   A. Be identified for both livestock and wildlife.

   B. Produce >40 percent of the forage.

   C. Represent moderate to high use by grazers.

7. Key plants shall be identified in the conservation plan using the following criteria:

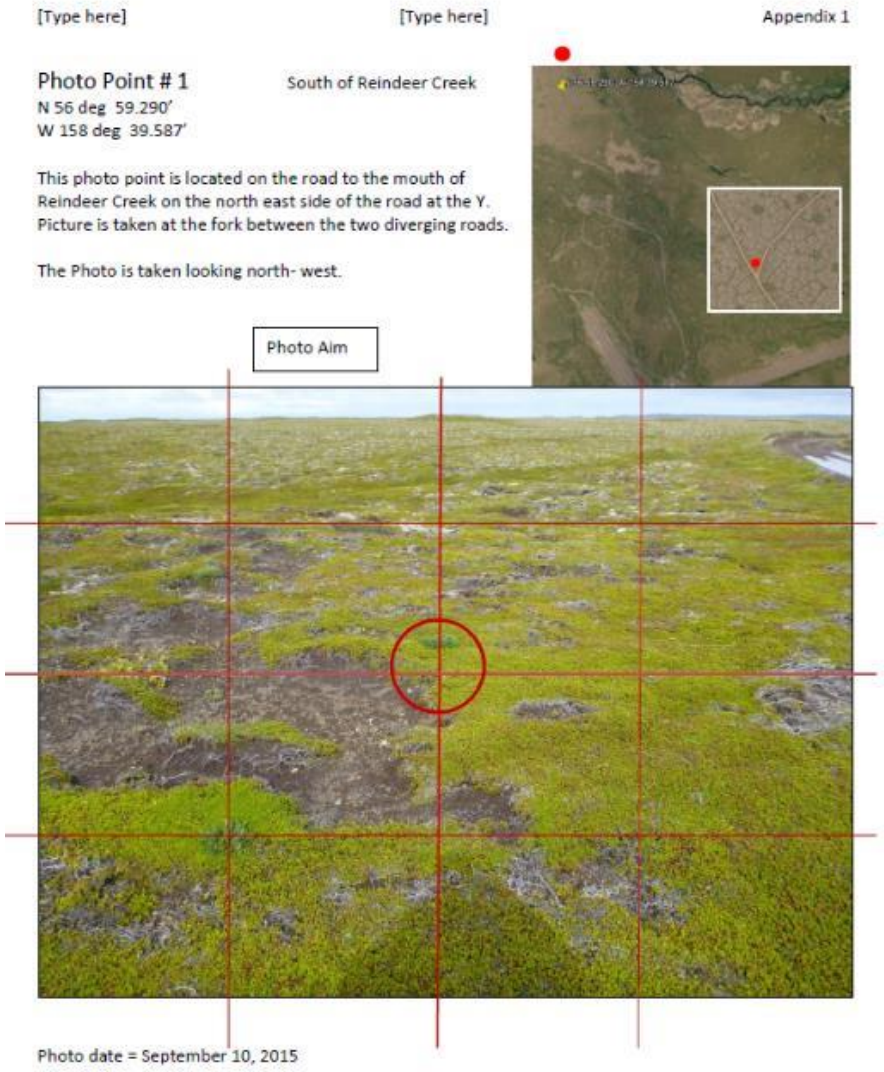
   A. Represent >15 percent composition of the annual production.

   B. Be an important forage plant suited to meet animal and grazing management objectives.

   C. Be designated as necessary on a seasonal basis to accommodate seasonal diet composition changes for different animals. With some animal species, it may be necessary to designate two or more different key plants, depending upon season of use.

When Planning

- Establish a photo point(s)



Certifying:

Document what happened

- Measurements of 20 grazed species in the key area
- Photo point
- Records from producer

NRCS
Natural Resources Conservation Service

Prescribed Grazing
Proper Grazing Use Worksheet AK-ECS-528-8 July 2004

Client: ______ Location: ______ Completed by: ______ Date: ______

Grazing Unit	Acres	Species of Grazing Animal	Season of Use	Location of Key Grazing Area	Key Plant(s) For Judging Proper Grazing Use	Planned Use of Key Species at End of Grazing Period	Estimated Use of Key Species by Weight 2004	2005	2006	2007	2008
					Initials of Conservationist Assisting with Application						
					Dates of Application Checks						

Compare Rangeland Health Score with Quality Criteria to Show $Financial Assistance$ Need

- 18 **DEGRADED PLANT CONDITION – Undesirable plant productivity and health**	Plant productivity, vigor and/or quality negatively impacts other resources or does not meet yield potential due to improper fertility, management or plants not adapted to site This includes addressing pollinators and beneficial insects.	• Range*	Use Assessment Tools and Planning Criteria	Rangeland Health Assessment (RHA) Rangeland Trend Worksheet Similarity Index Worksheet Ecological Site Descriptions (ESD's) or eFOTG Sec II	RHA – biotic integrity attribute rating is slight to moderate departure or less **OR** Vegetation meets a similarity index of 60 or greater for desired plant community and has a positive trend **AND** Plants are adapted to this site, meet production goals and do not negatively impact other resources
				Biology TN 34 Alaska Pollinator Habitat Assessment	**OR** Plant productivity is managed for pollinators as a client objective **AND** Achieve a post-implementation score of at least 100, with an improvement of at least 40 points.
				Biology TN 35 Beneficial Insect Habitat Assessment	**OR** Plant productivity is managed for beneficial insects as a client objective **AND** Achieve a post-implementation score of at least 110 points, with an improvement of at least 40 points.
		• Pasture*	Use Assessment Tools and Planning Criteria	Pasture Condition Scoresheet (PCS)	PCS - desirable plants element score ≥ 3 **AND** PCS - plant cover element score ≥ 4 **AND** PCS - plant vigor element score ≥ 4 **AND** PCS total ≥ 30 **AND** Plants are adapted to the site, meet production goals and do not negatively impact other resources
				Biology TN 34 Alaska Pollinator Habitat Assessment	**OR** Plant productivity is managed for pollinators as a client objective **AND** Achieve a post-implementation score of at least 100, with an improvement of at least 40 points.

What needs to be in a grazing plan?

- Ecological Site Descriptions (acres by field)
- Current conditions: Trend, Similarity, Utilization (maps)
- Rangeland health assessment
- Animal description/needs
- Field descriptions
- Feed/forage balance sheet
- Rotation plan showing three years and approximate movement dates based on calculations (referencing leaf lengths as the deciding factor)
- Key areas on plan map
- Photo point to monitor changes over time
- Contingency Plan

What documents are important?

- Prescribed Grazing Specification
- Prescribed Grazing Implementation Requirements
- FOTG Section 4 Documents under PG
- Your Job Approval Authority
- Planning criteria
- Rangeland health assessment
- Prescribed grazing plan
- Photo-Point description/set-up
- National Range and Pasture Handbook
- Apparent Trend Assessment
- Similarity Index Assessment

Install some simple trials.

Utilize Utilization Cages. Permanent exclosures and mobile cages tell us different things.

Photo Points are invaluable for your education and technical skill development, as well as for communicating changes in management to your producers

Photo Points are invaluable for your education and technical skill development, as well as for communicating changes in management to your producers