Prescribed Grazing - Appendix C

NORTH DAKOTA NRCS
GRAZING LAND INVENTORY AND ANALYSIS PROCESS

Inventory process:

Following is the process which NRCS Field Office Staff will use to complete a grazing land (rangeland, pastureland, annual forages, hayland, and/or crop aftermath) inventory of grazing unit or ranch. This process should be completed with the producer in order to get a complete understanding of the operation. The inventory will provide the conservation planner and producer with good information about their physical, vegetative and animal resources to make decisions on conservation alternatives for improved grazing management. Discussions with the producer will be documented on the ND-CPA-6, Conservation Assistance Notes. The client is required to provide NRCS the applied grazing schedule in order to determine if the requirements of 528 have been met. ND-CPA-556, Prescribed Grazing Schedule (hardcopy or electronic) may be used for documentation. If other documentation is used in lieu of the ND-CPA-556 Prescribed Grazing Schedule it must identify the planned and applied periods of grazing, recovery/deferment dates, and other treatment activities for each grazing unit.

Items Needed During the Inventory:

- ND-CPA-415 Landscape Appearance worksheet
- ND-CPA-6 Conservation Assistance Notes
- ND-CPA-33 Forage Production Clipping Worksheet
- ND-CPA-20 Similarity Index Worksheet
- ND-CPA-30 Preference Based Stocking Rate Determination for Rangeland
- ND-CPA-31 Rangeland Apparent Trend Worksheet
- ND-CPA-32 Pasture Condition Score Sheet
- ND-CPA-1 Livestock Forage Balance Worksheet
- ND-CPA-52 Environmental Effects for Conservation Planning
- ND-CPA-19 Grazing Land Forage Inventory Summary
- Rangeland Health Assessment Worksheet
- Other Items needed:
    - Clippers, 100 or 200 gram scale and bags
    - 1.92 Sq ft clipping frame or larger
    - Measuring ruler or tape in inches
    - Table 1 from Appendix A of the 528 DIG - % Height to Weight Removed Chart
    - Soil Field Guide for Identifying Ecological Sites, Version 1.4
    - Ecological or range site descriptions
    - Forage suitability group descriptions
    - Soil maps and soil interpretations
    - Sharp shooter (Shovel)
    - Aerial photos
    - Pencils and markers
    - GPS, camera, binoculars (optional)

Physical Inventory:

The following existing structures will be noted on the **inventory map** during the on site inventory. Include only the functional physical structures on the final Plan Land Use map by using the Standard Mapping Symbols. Use the Standard Mapping Symbols or toolkit supplied symbols where applicable and/or shorthand notes to identify the structures and give important information about the structures. If more information is needed, sub note the structure and discuss on back of inventory map or use additional note paper. Using color markers or highlighters can help make the situation standout more which will aid the planner to see existing resource situations and help identify where problems exist more readily. Again these colors should be used on the inventory map only. Do not place sensitive information such as cultural resource locations on the final conservation planning maps:

- Water developments – note type and reliability
- Existing fences – note type and condition
- Existing usable power sources for potential well sites
- Salt, mineral and creep feeder locations
- Trailing, gully erosion, blowout and other eroded areas

Vegetative Inventory:

The vegetative inventory process will help the planner and the producer assess the following:

- Productivity and health of the existing vegetative resources
- Potential vegetative resources
- Livestock feed-forage balance
- Types, use, and location of available forages
- Types and location of noxious weeds
- Existing and potential wildlife habitat

Rangeland Procedure:

The following information will be collected throughout each rangeland pasture and over the entire rangeland resource. At a minimum, 2 key management sites which are representative of the operating unit (generally considered the two ecological sites which make up the majority of the acres of the operating unit) will be identified and the following information collected:

- Similarity index – ND-CPA-20
  and
- Apparent Trend – ND-CPA-31
  and/or
- Rangeland Health Assessment

Sites where field data is collected (2 sites minimum) may also be used as future follow-up and monitoring locations. Therefore, it is important these locations be identified on the land use map with GPS coordinates and photos, if possible.

If time does not permit collection of data on other sites across the unit, the data collected at the two representative sites may be used as a reference to compare and interpret the resource condition of the same sites on other portions of the unit. Sites with similar production and/or similarity index to one of the representative sites on the unit may be noted on the planning map or appropriate inventory form.

Steps:

1. **Determine/verify the Ecological Site for this Sample Location** – Use soil maps and soil interpretations along with the Soil Field Guide for Identifying Ecological Sites. Indicate the ecological site determined on the inventory map by using the Ecological Site abbreviation (i.e. Ly for a Loamy ecological site). Accepted ecological site abbreviations can be found on pages 26 and 27 of *Soil Field Guide for Identifying Ecological Sites*
2. **Identify and Mark the Sampling Location on the Inventory Map** – Place a bracketed [R1] on the inventory map to identify the sampling location. R signifies that you are sampling rangeland, and the number 1 indicates this is your first sample point. *Use this designation to identify this sampling point on all data collection forms and worksheets to tie the sample location on the inventory map to the information on the worksheets.* Use of GPS coordinates is recommended to record site location.
3. **Determine Production** – Use ND-CPA-33 worksheet when clipping or estimating the production at the sampling location. When using the ND-CPA-33 on rangeland, use the production obtained from column “M” as the “(I) Total annual biomass” on the ND-CPA-20. When clipping to determine production, a minimum of three frames will be clipped and averaged per site.
4. **Determine Rangeland Similarity Index** – Use ND-CPA-20 to determine the similarity index for the ecological site at the sample point.

5. **Determine Apparent Trend** – Use ND-CPA-31 to determine the apparent trend for the ecological site at the sampling location.
6. **Assess Rangeland Health** – Use Version 4 of Interpreting Indications of Rangeland Health to assess the three attributes of rangeland health.
7. **Utilization mapping (optional).** Delineate major grazing use patterns within the pasture or evaluate the pasture as a whole using the ND-CPA-415. Indicate on the inventory map the appropriate landscape appearance class for the entire pasture or major use pattern within the pasture.

Tame Grass Pastures or Hayland Procedure:

The following information will be collected for tame grass pasture and hayland field(s). Collect an adequate number of samples that reflect the average productivity of the pasture or hayland fields across the operating unit.

- Pasture production and forage species identified – ND-CPA-33.
- Pasture Condition Score determined – ND-CPA-32.
- Hayland – To determine hayland productivity, request yield data during producer interview or production clipping of representative site or consult appropriate Forage Suitability Group.

Sites where field data is collected may also be used as future follow-up and monitoring locations. Therefore, it is important these locations be identified on the land use map with GPS coordinates and photos, if possible.

If time does not permit collection of data on all sites across the unit, the data collected at a couple of representative sites may be used as a reference to compare and interpret the resource condition of the same sites on other portions of the unit. Sites with similar production to one of the representative sites on the unit may be noted on the planning map or appropriate inventory form.

Steps:

1. **Identify and Mark the Sampling Location on the Inventory Map** – Place a bracketed [P1] or a [H] on the inventory map to identify the sampling location. P signifies that you are sampling Tame Pastureland and H signifies that you are sampling Tame Hayland. The number 1 indicates this is your first sample point for the land use type*. Use this designation to identify this sampling point on all data collection forms and worksheets to tie the sample location on the inventory map to the information on the worksheets.* Use of GPS coordinates is recommended to record site location.
2. **Determine the Type of Forage to be Managed** - Indicate on the inventory map the key forage species for the field.
3. **Determine/verify the Forage Suitability Group for Sample Location** – Use soil maps and soil interpretations to make this determination and indicate on inventory map.
4. **Determine Production** – Use ND-CPA-33 worksheet when clipping or estimating the production at the sampling location. Production on hayland may also be obtained during client interview (i.e. a 25 acre field producing 50 bales each weighing 1200 lb that would equate to about 2400 lbs /ac). When clipping to determine production, a minimum of three frames will be clipped and averaged per site.
5. **Determine the Pasture Condition Score** – Use ND-CPA-32 Pasture Condition Score Sheet to determine the pasture condition indicator score and record suggested management changes, as appropriate.
6. **Utilization mapping (optional).** Delineate major grazing use patterns within the pasture or evaluate the pasture as a whole using the ND-CPA-415. Indicate on the planning map the appropriate landscape appearance class for the entire pasture or major use pattern within the pasture.

Annual Forages and Crop Aftermath Procedure:

The following information will be collected for cropland seeded to annual forages or cropland fields grazed after harvest. Usable forage production from annual forages or crop aftermath is highly variable and can be difficult to predict due to a number of factors. Factors such as precipitation, type of annual forage or crop residue, amount of volunteer crop growth after harvest and level of grazing management can affect the amount of forage available and the efficiency with which the animal will harvest the forage.

Options for estimating forage production on annual forages and crop aftermath would include one or more of the following:

1. Determine amount of usable forage by clipping, drying and weighing forage samples from a representative site(s), use ND-CPA-33. When clipping to determine production, a minimum of three frames will be clipped and averaged per site.
2. Utilize client's knowledge of previous years' production (i.e. hay yield from previously harvested annual forages) and/or previous grazing levels.
3. Use of Tables 1-8 in the Analysis and Interpretation section.

Additional information on the use of annual forages, including potential livestock health problems, can be found at the following web sites.

http://www.ag.ndsu.nodak.edu/dickinso/research/1996/grazforg.htm
http://www.ext.nodak.edu/extpubs/beef.htm

Animal Inventory

Gather the animal inventory information from the producer for use on the ND-CPA-1.

- Type of herd (purebred, commercial, dairy)
- Kinds (cows, bison, elk, sheep etc)
- Classes (cow calf pairs, yearlings, dry cows)
- Average weights
- Number of animals in each herd during the grazing season
- Pastures for each herd
- Grazing dates for each pasture
- Breeding season
- Calving date
- Weaning date
- Potential conflicts with neighboring herds
- When normal winter feeding begins and ends

Analysis and Interpretation:

Note: Guidance provided in Chapter 11 of the NRCS *National Range and Pasture Handbook* is very specific regarding the role of NRCS planners in determining carrying capacity . Part 600.1103(j)(1) states, "NRCS does not establish grazing capacities. Neither does it require an agreed-on carrying capacity in conservation plans. NRCS assists land users in making their own decisions concerning the number and kinds of animals that can be safely and profitably grazed." For more information, see http://www.glti.nrcs.usda.gov/technical/publications/nrph.html

Complete the ND-CPA-19 based upon the information collected during the vegetative inventory. Accuracy and reliability of this estimated initial carrying capacity will be directly related to the amount and quality of the resource data collected and the experience/skill level of the planner. Estimated initial carrying capacity may be determined by using one or a combination of the following options:

- Using similarity index data collected from all the major rangeland sites and production data collected from all the major forage suitability groups on the unit, calculate an estimated initial carrying capacity using either the ND-CPA-30, Preference Based Stocking Rate, for rangeland and ND-CPA-33, Clipping to Determine Stocking Rates Based on Current Production on Tame Pasture, for pastureland.
- Use client's existing stocking rate figures in conjunction with results from landscape appearance worksheets to develop an estimated carrying capacity .
- Using production data collected from the representative key management sites on the operating unit calculate carrying capacity using the following formulas *(for those sites lacking production data, use the carrying capacity figures in Tables 1-8):.*
    - Rangeland: Pounds **air dry** annual production x 0.25 / 913 lbs/month = AUM/ac

- Pastureland: Pounds **air dry** annual production x 0.35 / 913 lbs/month = AUM/ac
- Crop aftermath or annual forages: Pounds **air dry** annual production x 0.25 / 913 lbs/month = AUM/ac

- For estimating initial carrying capacity on **tame pasture** without the benefit of field collected production data, refer to the appropriate Forage Suitability Group (FSG) description. When estimating a carrying capacity from an FSG, use forage production figure under "low management" multiplied by 0.35 harvest efficiency divided by 913 lbs of air dry forage to calculate AUM/ac.
- For estimating initial carrying capacity on **rangeland** without the benefit of field collected production data, use Tables 1-8 to establish an initial estimated carrying capacity for each ecological/range site. The estimated initial carrying capacity shown in these tables are estimates based upon knowledge and experience gained during past grazing land planning and follow-up efforts. These figures should only be used when actual inventory data is unavailable (i.e. initial planning phase) and may be supplemented by local knowledge.
- For cropland aftermath grazing and annual forages, use the figures in Table 9 to estimate initial carrying capacity if sites specific production data is unavailable.

Table 1. MLRA 53A Specific Estimated Initial Carrying Capacity [1, 2]
Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Clayey (Cy)	**0.4**	Clayey
Claypan (Cp)	**0.2**	Claypan
Loamy (Ly)	**0.4**	Silty
Loamy Steep (LyS)	**0.3**	Loamy
Overflow (Ov)	**0.7**	Overflow
Saline Overflow (SOv)	**0.7**	
Sandy (Sy)	**0.4**	Sandy
Shallow Clay (SwC)	**0.3**	Shallow
Shallow Gravel (SwG)	**0.3**	Shallow to Gravel
Subirrigated (Sb)	**1.1**	Subirrigated

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] MLRA 53A: Closed Depression (CD), Limy Subirrigated (LSb), Saline Overflow (SOv), Saline Lowland (SL), Sandy Claypan (SyCp), Shallow Clay (SwC), Very Shallow (VS), Wet Land (WL), and Wet Meadow (WM) ESD's are not completed. On-site inventories will need to be completed on these ESD's to determine initial carrying capacity.

Table 2. MLRA 53B Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Clayey (Cy)	**0.6**	Clayey
Claypan (Cp)	**0.5**	Claypan
Closed Depression (CD)	**0.8**	Closed Depression
Limy Subirrigated (LSb)	**1.0**	Subirrigated
[3] Linear Meadow (LrM)	**0.8**	
Loamy (Ly)	**0.7**	Silty
Loamy Overflow (LyOv)	**1.0**	Overflow
Saline Lowland (SL)	**0.6**	Saline Lowland
Sands (Sa)	**0.6**	Sands
Sandy (Sy)	**0.7**	Sandy
Sandy Claypan (SyCp)	**0.6**	Sandy Claypan
Shallow Loamy (SwLy)	**0.5**	Shallow
Shallow Gravel (SwG)	**0.3**	Shallow to Gravel
[2] Shallow Marsh (SwM)	**NA**	
Subirrigated (Sb)	**1.2**	Subirrigated
Thin Claypan (TCp)	**0.3**	Thin Claypan
Thin Sands (Tsa)	**0.4**	Thin Sands
Thin Loamy (TLy)	**0.5**	Thin Upland
Very Shallow (VS)	**0.3**	Very Shallow
[3] Wet Meadow (WM)	**0.6**	Wet Meadow

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] Shallow Marsh (SwM) recommended AUM/ac has been set to NA, please contact your area specialist if SwM is a major ecological site in the plan.

[3] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

Table 3. MLRA 54 Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Badlands Fan (BF)	**0.3**	
Choppy Sands (CS)	**0.4**	Thin Sands
Clayey (Cy)	**0.5**	Clayey
Claypan (Cp)	**0.4**	Claypan
Closed Depression (CD)	**0.7**	Closed Depression
Limy Sands (LSa)	**0.3**	Sands
Limy Residual (LR)	**0.4**	Thin Loamy
Loamy (Ly)	**0.5**	Silty
Loamy Overflow (LyOv)	**0.7**	Overflow
Loamy Terrace (LyT)	**0.7**	Overflow
Saline Lowland (SL)	**0.4**	Saline Lowland
Sands (Sa)	**0.5**	Sands
Sandy (Sy)	**0.5**	Sandy
Sandy Claypan (SyCp)	**0.5**	Sandy Claypan
Sandy Terrace (SyT)	**0.6**	Sandy
Shallow Clayey (SwCy)	**0.3**	Shallow
Shallow Loamy (SwLy)	**0.4**	Shallow
Shallow Sandy (SwSy)	**0.4**	Shallow
Shallow Gravel (SwG)	**0.3**	Shallow to Gravel
Subirrigated (Sb)	**1.0**	Subirrigated
Thin Claypan (TCp)	**0.2**	Thin Claypan
Thin Loamy (TLy)	**0.4**	Thin Upland
Very Shallow (VS)	**0.2**	Very Shallow
[2] Wet Land (WL)	**NA**	Wetland
[3] Wet Meadow (WM)	**0.6**	Wet Meadow

[1] Estimated carrying capacity is based upon ½ of the RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] Wet Land (WL) recommended AUM/ac has been set to NA, please contact your area specialist if WL is a major ecological site in the plan.

[3] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

Table 4. MLRA 55A Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Choppy Sands (CS)	**0.5**	Thin Sands
Clayey (Cy)	**0.7**	Clayey
[2] Clayey Alfic (CyA)	**NA**	Savannah
Claypan (Cp)	**0.5**	Claypan
[2] Deep Marsh (DM)	**NA**	Shallow Marsh
[2] Limy Wet Meadow	**NA**	Wet Meadow
Limy Subirrigated (LSb)	**1.1**	Subirrigated
Loamy (Ly)	**0.8**	Silty
[2] Loamy Alfic (LyA)	**NA**	Savannah
[2] Loamy Floodplain (LyFp)	**NA**	Overflow
Loamy Overflow (LyOv)	**1.0**	Overflow
Saline Lowland (SL)	**0.6**	Saline Lowland
Sands (Sa)	**0.7**	Sands
Sandy (Sy)	**0.8**	Sandy
Sandy Claypan (SyCp)	**0.7**	Sandy Claypan
Shallow Loamy (SwLy)	**0.6**	Shallow
Shallow Gravel (SwG)	**0.5**	Shallow to Gravel
[3] Shallow Marsh (SwM)	**NA**	
Subirrigated (Sb)	**1.3**	Subirrigated
Subirrigated Sands (SbSa)	**0.9**	Subirrigated Savannah
Thin Claypan (TCp)	**0.4**	Thin Claypan
Thin Loamy (TLy)	**0.6**	Thin Upland
Very Shallow (VS)	**0.4**	Very Shallow
[3] Wet Land (WL)	**NA**	Wetland
[4] Wet Meadow (WM)	**0.6**	Wet Meadow
[2] Wet Sedge Meadow (WSM)	**NA**	Wet Meadow

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] ESD's for these sites have not been written, no data exisits. An on-site inventory will need to be conducted to determine initial carrying capacity.

[3] Wet Land (WL) and Shallow Marsh (SM) recommended AUM/ac has been set to NA, please contact your area specialist if WL or SM is a major ecological site in the plan.

[4] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

Table 5. MLRA 55B Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Choppy Sands (CS)	**0.5**	Thin Sands
Clayey (Cy)	**0.7**	Clayey
Claypan (Cp)	**0.5**	Claypan
Limy Subirrigated (LSb)	**1.1**	Subirrigated
[3] Linear Meadow (LrM)	**0.8**	
Loamy (Ly)	**0.8**	Silty
Loamy Overflow (LyOv)	**1.0**	Overflow
Saline Lowland (SL)	**0.6**	Saline Lowland
Sands (Sa)	**0.7**	Sands
Sandy (Sy)	**0.8**	Sandy
Sandy Claypan (SyCp)	**0.7**	Sandy Claypan
Shallow Loamy (SwLy)	**0.6**	Shallow
Shallow Gravel (SwG)	**0.5**	Shallow to Gravel
[2] Shallow Marsh (SwM)	**NA**	
Subirrigated (Sb)	**1.3**	Subirrigated
Subirrigated Sands (SbSa)	**0.9**	Subirrigated Savannah
Thin Claypan (TCp)	**0.4**	Thin Claypan
Thin Loamy (TLy)	**0.6**	Thin Upland
Very Shallow (VS)	**0.4**	Very Shallow
[3] Wet Meadow (WM)	**0.6**	Wet Meadow

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] Shallow Marsh (SwM) recommended AUM/ac has been set to NA, please contact your area specialist if SwM is a major ecological site in the plan.

[3] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

Table 6. MLRA 56 Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Choppy Sands (CS)	**0.5**	Thin Sands
Clayey (Cy)	**0.6**	Clayey
Claypan (Cp)	**0.5**	Claypan
Limy Subirrigated (LSb)	**1.1**	Subirrigated
Loamy (Ly)	**0.8**	Silty
Loamy Overflow (LyOv)	**1.0**	Overflow
Saline Lowland (SL)	**0.6**	Saline Lowland
Sands (Sa)	**0.7**	Sands
Sandy (Sy)	**0.8**	Sandy
Sandy Claypan (SyCp)	**0.7**	Sandy Claypan
[2] Shallow Marsh (SwM)	**NA**	
Subirrigated (Sb)	**1.3**	Subirrigated
Subirrigated Sands (SbSa)	**0.9**	Subirrigated Savannah
Thin Claypan (TCp)	**0.4**	Thin Claypan
Thin Loamy (TLy)	**0.6**	Thin Upland
Very Shallow (VS)	**0.4**	Very Shallow
[3] Wet Meadow (WM)	**0.7**	Wet Meadow

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] Shallow Marsh (SwM) recommended AUM/ac has been set to NA, please contact your area specialist if SwM is a major ecological site in the plan.

[3] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

Table 7. MLRA 58C Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Badlands Fan (BF)	**0.3**	
Choppy Sands (CS)	**0.3**	Thin Sands
Clayey (Cy)	**0.4**	Clayey
Clayey Terrace (CyT)	**0.4**	Clayey
Claypan (Cp)	**0.4**	Claypan
[2] Flat Bottem Wooded Draw (FBWD)	**NA**	Savannah
Limy Sands (LSa)	**0.2**	Sands
Limy Residual (LR)	**0.3**	Thin Loamy
Loamy (Ly)	**0.4**	Silty
Loamy Overflow (LyOv)	**0.6**	Overflow
Loamy Terrace (LyT)	**0.5**	Overflow
Saline Lowland (SL)	**0.4**	Saline Lowland
Sands (Sa)	**0.4**	Sands
Sandy (Sy)	**0.4**	Sandy
Sandy Claypan (SyCp)	**0.4**	Sandy Claypan
Sandy Terrace (SyT)	**0.5**	Sandy
Shallow Clayey (SwCy)	**0.3**	Shallow
Shallow Loamy (SwLy)	**0.3**	Shallow
Shallow Sandy (SwSy)	**0.3**	Shallow
[2] Steep Sided Wooded Draw (SSWD)	**NA**	Savannah
Thin Claypan (TCp)	**0.2**	Thin Claypan
Thin Sands (Tsa)	**0.3**	Thin Sands
Very Shallow (VS)	**0.2**	Very Shallow
[3] Wet Land (WL)	**NA**	Wetland
[4] Wet Meadow (WM)	**0.6**	Wet Meadow

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] An on-site inventory will need to be conducted to determine initial carrying capacity.

[3] Wet Land (WL) recommended AUM/ac has been set to NA, please contact your area specialist if WL is a major ecological site in the plan.

[4] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

Table 8. MLRA 58D Specific Estimated Initial Carrying Capacity [1] Ecological Site (abbreviation)

Ecological Site	AUM/ac	Original Range Site Name
Choppy Sands (CS)	**0.3**	Thin Sands
Clayey (Cy)	**0.4**	Clayey
Claypan (Cp)	**0.3**	Claypan
Closed Depression (CD)	**0.6**	Closed Depression
Limy Residual (LR)	**0.3**	Thin Loamy
Loamy (Ly)	**0.4**	Silty
Loamy Overflow (LyOv)	**0.6**	Overflow
Loamy Terrace (LyT)	**0.6**	Overflow
Saline Overflow (SOv)	**0.5**	
Saline Lowland (SL)	**0.3**	Saline Lowland
Sands (Sa)	**0.4**	Sands
Sandy (Sy)	**0.4**	Sandy
Sandy Claypan (SyCp)	**0.4**	Sandy Claypan
Sandy Terrace (SyT)	**0.5**	Sandy
Shallow Clayey (SwCy)	**0.2**	Shallow
Shallow Loamy (SwLy)	**0.3**	Shallow
Shallow Sandy (SwSy)	**0.3**	Shallow
Stony Hills (SH)	**0.3**	
Thin Claypan (TCp)	**0.1**	Thin Claypan
Thin Sandy (Tsy)	**0.5**	Thin Sands
Thin Loamy (TLy)	**0.3**	Thin Upland
Very Shallow (VS)	**0.1**	Very Shallow
[3] Wet Land (WL)	**NA**	Wetland
[2]Wet Meadow (WM)	**0.5**	Wet Meadow

[1] Estimated carrying capacity is based upon RV production for the reference plant community using 25 % Harvest Efficiency, and air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM. On some Ecological Sites, the carrying capacity was reduced below the calculated values by the range staff to reflect the most common Ecological and Production values experienced in the field.

[2] Wet Meadow (WM) and Linear Meadow (LM) estimated carrying capacity based upon RV production for the reference plant community using **12.5% harvest efficiency**, an air dry matter intake of 30 lbs/day and 30.5 days per month rounded to the nearest tenth of an AUM.

[3] Wet Land (WL) recommended AUM/ac has been set to NA, please contact your area specialist if WL is a major ecological site in the plan.

Table 9.

Harvested Roughage 1/		Annual Pasture 2/		Crop Aftermath 3/	
All Hay	3.0 AUM's/ton	Sudan Grass	2.0–4.0 AUM's/ Ac	Small Grain Stubble	0.1-0.2 AUM's/Ac
Corn Silage	1.2 AUM's/ton	Winter Rye	0.5-2.0 AUM's/Ac	Corn Stalks	0.3-0.6 AUM's/Ac
Grass Silage	0.9 AUM's/ton	Spring Grains	.5-2.0 AUM's/Ac	Irrigated Corn Stalks	1.0-2.0 AUM's/Ac
Corn Fodder	2.0 AUM's/ton	Cover Crops	See footnote 4/ below	Sunflower Stalks	0.1-0.3 AUM's/Ac
Wheat Straw	1.5 AUM's/ton			Dry Beans, Soybeans	0.0-0.3 AUM's/Ac
				Hayland Regrowth	0.1-0.3 AUM's/Ac

Table 9. Table Source: ND NRCS Pasture and Hayland Management Conservation Practice 510. December 1984 page 8.

1/ Roughage assumed to be of good quality, reduce values if hay cut late or badly weathered prior to feeding.

2/ Assume 1.0 AUM for each 1500 pounds of air dry forage production. The difference between allowance and use is to allow for trampling loss.

3/ AUM ratings are based on the following: 0.1 AUM for each 10 bu production on small grain and corn. 0.15 AUM for each 10 bu production on irrigated corn, 0.1 AUM for each 1000 lbs seeds on sunflowers. On erosive soils, aftermath grazing may have to be reduced or eliminated so adequate cover can be maintained.

4/ Cover crop production can vary depending on the season of planting, days of growth, selected species, and soil moisture conditions. Please see NDSU Extension Publication R1759 Annual Cover Crop Options for Grazing and Haying in the Northern Plains for further cover crop nutritional information https://www.ag.ndsu.edu/pubs/ansci/range/r1759.pdf 75% harvest efficiency can be used for full utilization and 35% harvest efficiency can be used to estimate "take half leave half". Utilization levels may vary based on primary objectives of the cover crop planting (e.g. leaving greater residue for erosion protection, etc.). Producers and planners are encouraged to review the above Annual Forages and Crop Aftermath Procedure section for estimating production and initial carrying capacities.

Using the information from the animal inventory and the ND-CPA-19 complete the ND-CPA-1, Livestock-Forage Balance Sheet, and the ND-CPA-556, Prescribed Grazing Schedule, as needed.