11158 - Little Missouri Grazing Association - Deep Creek Watershed Conservation Project

Application Details

Funding Opportunity:	7583-Outdoor Heritage Fund May 2021 - Round 18
Funding Opportunity Due Date:	May 3, 2021 11:59 PM
Program Area:	Outdoor Heritage Fund
Status:	Under Review
Stage:	Final Application
Initial Submit Date:	May 3, 2021 2:56 PM
Initially Submitted By:	Shane Goettle
Last Submit Date:	Jun 3, 2021 10:39 AM
Last Submitted By:	Shane Goettle

Contact Information

Primary Contact Information

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Comments:	

Organization Information

Status*:	Approved
Name*:	Little Missouri Grazing Association
Organization Type*:	In-State Non-Profit
Tax Id:	

Organization Website:

Address*: 202 Inman St.

Amidon North Dakota 58620-0000
City State/Province Postal Code/Zip

Phone*: 701-523-6471 Ext.
###-###-####
###-###-####

Budget

Objective of Grant

Objective of Grant:

Preserve 8,314 AUMs of livestock grazing allowed by the USDA Forest Service; implement prescribed grazing strategies to improve native grasses and forbs; enhance wildlife habitat; and improve water quality.

Summary

Grant Request:	$227,102.00
Matching Funds:	$1,206,523.00
Total Project Costs:	$1,433,625.00

You must have at least 25%match

Percentage of Match:	84.16%

Project Expenses

Project Expense Description	OHF Request	Match Share (Cash)	Match Share (In-Kind)	Match Share (Indirect)	Other Project Sponsor's Share	Total Each Project Expense
In-kind technical assistance with environmental evaluations, range management, monitoring	$0.00	$0.00	$0.00	$0.00	$164,354.00	$164,354.00
Technical Assistance & Education for prescribed grazing systems and tree planting	$0.00	$0.00	$0.00	$0.00	$22,500.00	$22,500.00
Year 1 & 2 - cultural/NEPA reviews	$50,000.00	$0.00	$0.00	$0.00	$0.00	$50,000.00
Year 1 - drill 4 wells, install 5 solar pumps, 4m pipeline, 14 stock tanks	$48,370.00	$0.00	$0.00	$0.00	$127,345.00	$175,715.00
Year 2- drill 5 wells, install 5 solar pumps, 3.5m pipeline, 10 stock tanks, 2.5m cross fence	$45,385.00	$5,190.00	$0.00	$0.00	$133,153.00	$183,728.00
Year 3 - 4m pipeline, 10 stock tanks, 3.5m cross fence, drill 1 well, install 1 solar pump, seed 85a	$52,601.00	$7,266.00	$0.00	$0.00	$157,616.00	$217,483.00
Year 4 - plant 5000 shrubs/trees, initiate prescribed grazing incentive payments on 2 allotments	$22,988.00	$0.00	$0.00	$0.00	$60,521.00	$83,509.00
Year 5 - plant remaining trees, pay for prescribed grazing incentive payment	$7,758.00	$0.00	$0.00	$0.00	$20,426.00	$28,184.00
Year 1-5 technical assistance	$0.00	$0.00	$0.00	$0.00	$149,070.00	$149,070.00
Lead Partner/project coordinator, providing administrative services, monitoring, and office supplies	$0.00	$194,082.00	$165,000.00	$0.00	$0.00	$359,082.00
	$227,102.00	**$206,538.00**	**$165,000.00**	**$0.00**	**$834,985.00**	**$1,433,625.00**

Budget Narrative

Budget Narrative:

The Little Missouri Grazing Association's (LMGA) goals are to preserve the 8,314 AUMs of livestock grazing allowed by the Forest Service; to implement pres cribed grazing strategies to improve native grasses and forbs; to enhance wildlife habitat, and to improve water quality.

Year 1 & 2 - Cultural/NEPA Reviews: In the first 2 years, LMGA will hire Beaver Creak Archeology for an estimated $50,000, who will supply an archeologist and environmental specialist to complete the required NEPA surveys. Their work will focus on the National Forest Lands while it is expected NRSC will focus on the range lands. We are requesting OHF funds to cover this contract.

Years 1-5: In years 1-5 the LMGA and its partners will drill a total of 10 wells, connect 10 solar pumps, install 62,000 feet of pipeline, install 34 water tanks, build 44,500 feet of cross fence, build 7 water lots around tanks and install 3 storage tanks to create the needed infrastructure to facilitate the prescribed graz ing systems. We are requesting $189,558 to be deployed over that 5 year period as match against the NRCS RCPP program dollars. LMGA members prop ose to match 20% of the cost of cross-fences ($5,190 in Year 2 & $7,266 in Year 3). We submit this ratio is fair given that up to 75% of the cross-fencing will occur on public lands. In addition to the cross fence match, throughout Years 1-5 the LMGA has also committed an additional $194,082 in cash and $165,00 0 in in-kind contributions (for a total of $371,538) to this project. The additional funds attach to LMGA serving as lead partner and project coordinator, providin g administrative services, monitoring, and office supplies.

Year 3: To move toward a native grass and forb plant community, the LMGA will plant 85 acres of crested wheatgrass to native grass and forbs in Year 3.

Year 4: In Year 4, 1 dugout and 1 reservoir will be decommissioned by filling in the impoundment areas and reseeding to native grasses and forbs.

Years 3-5: To restore native trees and shrubs to woody draws and the Deep Creek riparian area, the LMGA, and its partners will plant 5,000 trees and shrub s in years 3 through 5.

Note: the grazing incentive payments will come entirely from NRCS RCPP. The total for this is $19,171 in years 4 and 5.

Bid Attachments

Description	File Name	Type	Size	Upload Date
No files attached.				

Match Funding

Match Amount	Funding Source	Match Type
$22,500.00	Bowman-Slope Soil Conservation District	In-Kind
$164,354.00	USDA Forest Service	In-Kind
$499,061.00	USDA Natural Resource Conservation Service - Regional Conservation Partnership Program	Cash
$149,070.00	USDA Natural Resource Conservation Service - Regional Conservation Partnership Program	In-Kind
$206,538.00	Little Missouri Grazing Association	Cash
$165,000.00	Little Missouri Grazing Association	In-Kind
$1,206,523.00		

Description

Directives

Major Directive*: Directive B
Choose One

Additional Directive: Directive A,Directive C,Directive D
Choose All That Apply

Type of Agency*: Tax-exempt, nonprofit corporation
Choose One

Abstract/Executive Summary

Abstract/Executive Summary*:

Working with identified partners over the next five years, we will have installed the range infrastructure needed to move 11,327 acres of native grass/forb com munities in the southern half of the Deep Creek watershed toward the appropriate desired condition for each allotments' dominant ecological site and referenc e plant community. An Environmental Assessment identified that 6,069 acres of crested wheatgrass existed within the 20 allotments. Only 85 acres will be restored to a native grass/forb community. The remaining acres will be incorporated into prescribed grazing systems that will enhance the native grass pastu res. North Dakota State University conducted a 2-year vegetative data collection from ecological sites that included the southern half of the Deep Creek water shed. These study plots established the benchmark conditions of the existing plant community phases. The vegetation composition will be remeasured in 2 021 (10 years after the first data were collected). Four years of Visual Obstruction Readings (VOR) established an average of baseline structure measureme nts. The vegetative structure will be measured annually. Of the 24 miles of Deep Creek evaluated by the Proper Functioning Condition protocol, 3.7 miles we re found to be Functioning at Risk. These 3.7 miles will move toward proper functioning condition as livestock trails heal and grazing pressure has been redu ced. 4,600 native trees and shrubs will be planted within the Deep Creek riparian corridor. 4 woody draws will each have 100 native trees and shrubs planted to restore the declining woody draw plant community. Leafy spurge presence prevents more woody draw selection as those draws are continually treated wit h herbicide until the leafy spurge is eradicated. Within 20 years, the prescribed grazing systems will move 11,327 acres and 3.7 miles of Deep Creek toward appropriate plant reference communities.

Project Duration

Project Duration*:

As stated above and laid out in the project description, this is a five year project.

Narrative

Narrative

Briefly summarize your organization's history, mission, current programs and activities. Include an overview of your organizational structure, including board, staff and volunteer involvement.

Organization Information*:

The Little Missouri Grazing Association (LMGA) is part of the Dakota Prairie National Grasslands. It was formed in 1940 after the North Dakota legislature aut horized cooperative grazing associations in 1935. In 1937, the Bankhead-Jones Farm Tenant Act, as part of its actions, purchased land from homesteaders d evastated by the Great Depression and the extreme drought in that same time period. The LMGA assigned allotments to members and administered these s

ubmarginal lands on behalf of the federal government. The LMGA also integrated private and other non-federal land into the Association controlled land when necessary, to create natural management units that facilitate sound land management practices. The USDA Forest acquired these federal lands in 1954, an d the FS authorized grazing associations (including the LMGA) to administer and manage the federal land within the allotments. The LMGA collects the fede ral grazing fee from the members and delivers it to the FS. The LMGA manages range improvements and permitted livestock grazing activities. The LMGA ap plies for, and administers the Conservation Practice (CP) for installation across the LMGA. Conservation practices funded through the CP program requires t hat the members pay for 25% of the practice cost. The Secretary calculates the 25% of in-kind needed, and sends forms to participating members to collec t the in-kind information. The LMGA manages and disperses the CP funds set aside from the annual FS grazing fees. CP monies not used by the LMGA hav e to be returned to the US Treasury, so planners meticulously calculate the cost of all conservation practices.

Describe the proposed project identifying how the project will meet the specific directive(s) of the Outdoor Heritage Fund Program.

Identify project goals, strategies and benefits and your timetable for implementation. Include information about the need for the project and whether there is urgency for funding. Indicate if this is a new project or if it is replacing funding that is no longer available to your organization. Identify any innovative features or processes of your project.

Note: if your proposal provides funding to an individual, the names of the recipients must be reported to the Industrial Commission/Outdoor Heritage Fund. These names will be disclosed upon request.

If your project involves an extenuating circumstance to exempted activities please explain.

Purpose of Grant*:

By 2016, the Little Missouri Grazing Association (LMGA) allotment management plans developed in the late 1970s and early 1980s were outdated and did n ot reflect changes to NFS regulations or incorporate "best available science."

To develop the long-awaited allotment management plans, the Medora Ranger District (FS) needed to complete NEPA analysis required for all grazing allotm ents. To manage the overwhelming workload, the Medora Ranger District divided the Deep Creek Watershed approximately in half and analyzed the southern half of the watershed that included East Fork Deep Creek and West Fork Deep Creek. The DCVMP included 20 allotments for a total of 17,963 acres of NFS land, 2,818 acres of private land, and 637 acres of North Dakota state land. The DCVMP (published May 2019) decided to continue livestock grazing at the c urrent AUMs IF the LMGA and its affected members agreed to "initial actions" that included developing infrastructure to improve livestock distribution and fora ge utilization. At the current Conservation Projects (FS) funding level (two projects per year), the needed infrastructure, particularly water development, could not be completed for 20 years. The LMGA was compelled to request NRCS Regional Conservation Program Funding funding to facilitate range improvements to meet short term monitoring objectives described in the DCVMP. Although grazing at the current level is authorized under the final decision, adaptive mana gement is included as an alternative, and decreasing livestock numbers is a potential adaptive action if an allotment is not moving toward the objectives base d on monitoring results. Allotments that have not had infrastructure installed will be monitored and will be at risk for livestock reduction. With RCPP matched with OHF funds, the LMGA can install the required water developments and cross fencing that would draw livestock out of the riparian areas and achieve the herbaceous objectives for vegetation composition and wildlife habitat structure.

The Little Missouri Grazing Association's (LMGA) goals are to preserve the 8,314 AUMs of livestock grazing allowed by the Forest Service; to implement pres cribed grazing strategies to improve native grasses and forbs; to enhance wildlife habitat, and to improve water quality.

In the first 2 years, LMGA will hire Beaver Creak Archeology for an estimated $50,000, who will supply an archeologist and environmental specialist to compl ete the required NEPA surveys. Their work will focus on the National Forest Lands while it is expected NRSC will focus on the range lands. We are seeking OHF funds to cover this $50,000 of technical assistance.

The remaining request for OHF funds will be deployed over 5 years along side funds from the NRCS Regional Conversation Partnership Program. The LMGA and its partners will drill 10 wells, connect 10 solar pumps, install 62,000 feet of pipeline, install 34 water tanks, build 44,500 feet of cross fence, build 7 water lots around tanks and install 3 storage tanks to create the needed infrastructure to facilitate the prescribed grazing systems.

In years 2 and 3, the LMGA will install the cross-fences and are proposing that 20% of the cost of these cross-fences will be contributed by its members. W e submit this is a fair proposal as up to 75% of the cross-fencing will be on public lands.

To move toward a native grass and forb plant community, the LMGA will plant 85 acres of crested wheatgrass to native grass and forbs in Year 3.

In Year 4, 1 dugout and 1 reservoir will be decommissioned by filling in the impoundment areas and reseeding to native grasses and forbs.

To restore native trees and shrubs to woody draws and the Deep Creek riparian area, the LMGA, and its partners will plant 5,000 trees and shrubs in years 3 through 5. LMGA will adhere to USDA-NRCS tree/shrub/grass planting specifications and as required by the USDA Forest Service.

Please list the counties that would be impacted by this project:

Counties*:	Slope
Is This Project Part of a Comprehensive Conservation Plan?*:	Yes
If Yes, Please Provide Copy of Plan:	20190507FinalDeepCreekEA.pdf

Does Your Project Involve an Extenuating Circumstance?*: Yes

Please Explain:

The contribution by the Little Missouri Grazing Association is needed to initiate and support Year 1 of the project.

Provide a description of how you will manage and oversee the project to ensure it is carried out on schedule and in a manner that best ensures its objectives will be met. Include a brief background and work experience for those managing the project.

Management of Project*:

The LMGA will use land improvement/land management/restoration contracts to generate the conservation benefits needed to improve livestock distribution a nd forage utilization. LMGA members/producers are familiar with the NRCS EQIP and CSP contracts. The LMGA is administrative support dollars to facilitat e and monitor water development, cross fencing, riparian restoration and prescribed grazing based on NRCS practice standards and specifications.

Maxine Rasmussen, secretary, will oversee the deployment and monitorying of the OHF grant funds. She completes all accounting activities for the LMGA. This includes collecting the federal grazing fees and delivering the funds to the Forest Service. The secretary manages and disperses the Conservation Practi ce (CP) funds set aside from the the annual FS grazing fees. The secretary manages and disperses funds for noxious weed control and prairie dog control. The secretary provides annual performance reports and accounting reports to the Forest Service. The secretary must maintain acres treated in the reports an d success measurements. Reports include keeping a cumulative cost of projects and the cumulative payments received over the contracts? life.

Maxine Rasmussen is also the range technician for the LMGA. Duties include monitoring vegetative structure and vegetation composition through photo poin ts, visual obstruction reading, line intercept transects and other short term protocols. Maxine is a former NRCS Area Rangeland Management Specialist with 15 years of experience that included inventorying over a million acres of rangeland on 2 Indian reservations, training new employees, and certifying conservati on plans of NRCS employees in 10 counties.

Indicate how the project will be funded or sustained in future years. Include information on the sustainability of this project after OHF funds have been expended and whether the sustainability will be in the form of ongoing management or additional funding from a different source.

Sustainability*:

The LMGA directors and FS staff will annually monitor the established photo points to visually measure forage utilization on key ecological sites and riparian sites. These visual appraisals will indicate if rotations or season of use need to be altered.

The LMGA range technician will monitor the Proper Functioning Condition (PFC) photo points annually, and in 3 years, assist the FS resource specialists mo nitor the PFC qualitative and quantitative factors to determine a trend. The range technician will determine forage utilization with a Robel pole to document av ailable cover for wildlife.

The LMGA range technician will monitor vegetation composition in 2 years, using line intercept to determine frequency. Photo points will document the area. The range technician will annually monitor the woody draws and compare natural regeneration to the woody draws planted with native shrubs and trees. Shru bs and trees will be replaced annually as needed. In 5 years, the FS resource specialists will evaluate the vegetation composition, riparian condition, woody draws, sensitive plants, infrastructure condition, and grazing impacts to archaeological sites.

Fences and stock tanks will be maintained and repaired by LMGA members, as is common practice.

Indicate how the project will be affected if less funding is available than that requested.

Partial Funding*:

The LMGA will then need to turn to members to supply the funds, which will be particularly challenging with expected drought conditions in the the Slope Cou nty area. If the members could not come up with the funds, the project would be jeopardized.

If you are a successful recipient of Outdoor Heritage Fund dollars, how would you recognize the Outdoor Heritage Fund partnership? * There must be signage at the location of the project acknowledging OHF funding when appropriate. If there are provisions in that contract that your organization is unable to meet, please indicate below what those provisions would be.

Partnership Recognition*:

Signage at the site location is entirely possible. Multiple signage could be considered as well. In addition, the grazing association will publish the partnershi p in its member communications and in other publications as appropriate.

Do you have any supporting documents, such as maps or letters of support that you would like to provide? If so, please provide them in a single file.

Supporting Documents*: Yes

If Yes, Please Provide Copies in a Single File: RCPP support letters.pdf

Awarding of Grants - Review the appropriate sample contract for your organization. Sample Contract

Can You Meet All the Provisions of the Sample Contract?*: Yes

If there are provisions in that contract that your organization is unable to meet, please indicate below what those provisions would be:

Provisions Unable to Meet:

Tasks

Tasks

Task	Start Date	Completion Date
Year 1 - tasks (see budget)	10/01/2021	09/30/2022
Year 2 tasks (see budget)	10/01/2022	09/30/2023
Year 3 tasks (see budget)	10/01/2023	09/30/2024
Year 4 tasks (see budget)	10/01/2024	09/30/2025
Year 5 tasks (see budget)	10/01/2025	09/30/2026

Description of Tasks

Please Describe Tasks:

FY1-2: technical assistance contract
FY1: 4 wells, 5 solar pumps (1 on existing well), 4 miles pipeline and 14 stock tanks;
FY2: 5 wells, 5 solar pumps, 3.5 miles pipeline, 10 stock tanks, 2.5 miles of cross fence;
FY3: 4 miles of pipeline, 10 stock tanks, 3.5 miles cross fence, 1 well & solar pump, 2 storage tanks at 2 wells, seed 85 acres of crested wheatgrass to a n ative grass/forb mixture.
FY4- plant 5000 shrubs/trees
FY5 - plant remaining trees

Deliverables

Deliverables

Deliverable	Quantity	Unit of Measurement, if applicable
Annual reporting, evaluations, and expenditure reports	5.000	Years
Crested Wheatgrass to Native Grass and Forbs	85.000	Acres
Crossfence	44500.000	Feet
New infrastructure to maintain AUMS. Evidenced by completion of monitoring forms and analysis of vegetative cover.	1.000	
Pipeline (water)	62000.000	Feet
Solar Pumps	10.000	
Storage Tanks	3.000	
Trees/Shrubs	5000.000	
Water Lots around Tanks	7.000	
Water/Stock Tanks	34.000	
Wells	10.000	

Certification

Certification

Certification:

Name:	Chad Erickson First Name Last Name
Title:	President Title
Date:	05/03/2021

Internal Application Number

#ID:	18-18

Deep Creek Vegetation Management Project

Environmental Assessment

Forest Service Dakota Prairie Grasslands Medora Ranger District May 2019

For More Information Contact:

Shannon Boehm
Medora Ranger District
99 23rd Avenue West, Suite B
Dickinson, North Dakota 58601
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Cover photo of prickly pear cactus along Deep Creek, Slope County, ND

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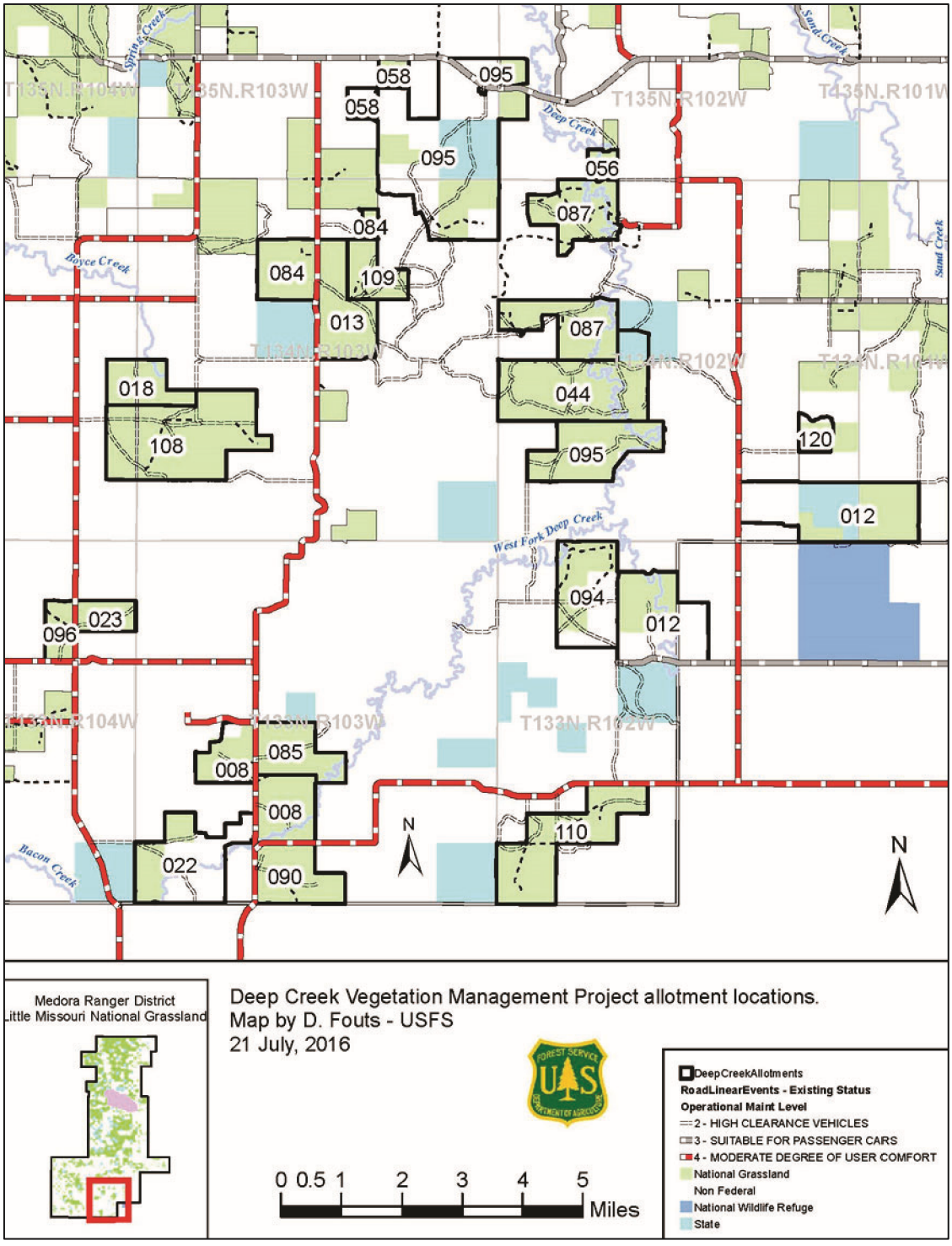

Figure 1. Deep Creek Vegetation Management Project Vicinity map

Introduction

District Ranger, Shannon Boehm, along with resource specialists at the Medora Ranger District of the Dakota Prairie Grasslands propose to authorize continued grazing and vegetation management under an adaptive management strategy on 20 grazing allotments. The proposed action responds

to the goals and objectives outlined in the Land and Resource Management Plan for the Dakota Prairie Grasslands (Grasslands Plan) and helps achieve the desired conditions described in that plan (USDA Forest Service 2001). We prepared this environmental assessment to determine whether implementation of livestock grazing and restoration activities may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement.

By preparing this environmental assessment, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act[1]. This analysis is tiered to the 2001 Final Environmental Impact Statement for the Northern Great Plains Plan Revision, and its planning record supporting the Grasslands Plan and subsequent records of decision.

Additional documentation, including more detailed analyses of project area resources can be found in the project record, located at the Medora Ranger District in Dickinson, North Dakota.

Proposed Project Location

The project area is located on the Medora Ranger District of the Dakota Prairie Grasslands in Slope County, North Dakota. The combined allotment boundaries make up the project area (Figure 1). The total project area encompasses approximately 17,693 acres of National Forest System lands and about 3,098 acres of state and private lands. The project area includes 20 allotments that are under permit through a grazing agreement between the Forest Service and the Little Missouri Grazing Association (grazing association). The allotments in this project proposal are listed in Table 1 and displayed in Figure 1. Allotment acreages are displayed in Appendix D.

Table 1. Allotments included in the Deep Creek Vegetation Management Project

Allotments
8, 12, 13, 18, 22, 23, 44, 56, 58, 84, 85, 87, 90, 94, 95, 96, 108, 109, 110, 120

Grazing Management on the Dakota Prairie Grasslands

Grazing on the Dakota Prairie Grasslands is permitted through grazing agreements held by individual grazing associations. Grazing agreements are issued for 10-year periods. The grazing association is the “permittee” and is issued a grazing permit to administer livestock grazing on National Grasslands. The grazing association, in turn, issues annual permits to its members to graze their livestock on one or more of the grazing allotments. Each allotment is managed using an allotment-specific management plan that is based on an analysis of the effects of a proposed action and alternatives, and a subsequent National Environmental Policy Act decision. Allotment management plans are the tool used by the Forest Service to communicate management objectives and the actions planned to accomplish those objectives. The Forest Service issues annual operating instructions consistent with each allotment management plan.

This project-level National Environmental Policy Act analysis and decision, and associated allotment management plans, will guide future livestock grazing management and associated vegetation management activities within the project area. The new allotment management plans developed through this National Environmental Policy Act process reflect the implementation

[1] Code of Federal Regulations 36 CFR Part 220, Forest Service Handbook 1909.15, and Council on Environmental Quality regulations (40 CFR 1500).

stage of project activities and are not subject to further National Environmental Policy Act documentation.

Relevant Laws, Regulations, and Policy

Grazing management on the Little Missouri National Grassland is governed under the provisions of the Bankhead-Jones Farm Tenant Act (7 USCS §§ 1000 et seq), the Forest and Range Renewable Resources Planning Act, the National Forest Management Act, Forest Service Regulations 36 CFR 213 (Administration of Lands under Title III of the Bankhead-Jones Farm Tenant Act by the Forest Service), 36 CFR 222 (Range Management) and other laws relating to National Forest System lands.

Grasslands Plan Direction

The Grasslands Plan guides the management of natural resources on the Grasslands and provides an overall strategy for its management. Direction in the Grasslands Plan is provided at a Grasslands-wide level, by management area, and by geographic area. This direction describes the desired conditions and lists objectives, standards, and guidelines for individual management areas and geographic areas.

Grazing is one of the many uses allowed on the Grasslands. The 2006 Livestock Grazing Record of Decision, which adopted the Dakota Prairie Grasslands Plan, made the decision to authorize grazing on the Dakota Prairie Grasslands through the issuance of grazing agreements or grazing permits. This decision to authorize grazing satisfies the requirements of the Rescissions Act (Section 504 of Public Law 104-19, July 27, 1995; USDA Forest Service 2006).

About 99 percent of the project area is in Grasslands Plan Management Area 6.1 – Rangelands with Broad Resource Emphasis. This area is primarily a rangeland ecosystem managed to meet a variety of ecological conditions and human needs. Ecological conditions will be maintained while emphasizing selected biological (grasses and other vegetation) structure and composition that consider the range of natural variability. These lands often display high levels of development, commodity uses, and activity; density of facilities; and evidence of vegetative manipulation (Grasslands Plan, page 3-43). The remaining one percent of the project area is in management area 2.1 – Special Interest Areas. These areas are managed to protect sites with important physical, biological, and cultural characteristics for the purpose of public use and enjoyment (Grasslands Plan, page 3-8). The Black Butte special interest area is located partially within allotment 120. Management emphasis in this area is on protecting the unique botanical community, wildlife and heritage resources, and the traditional landscape. The Roundtop Butte special interest area falls within allotment 44, and was designated to protect the unique botanical community.

The project area falls within the Rolling Prairie Geographic Area.

Project actions are intended to respond to the following Grasslands Plan goals and objectives:

- **Goal 1 (Grasslands Plan, page 1-2):** Promote ecosystem health and conservation using a collaborative approach to sustain the Nation's forests, grasslands, and watersheds.
  - **Goal 1.a (Grasslands Plan, page 1-2):** Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial water uses.

- **Goal 1.b (Grasslands Plan, page 1-2):** Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS).
- **Goal 1.c (Grasslands Plan, page 1-3):** Increase the amount of forests and grasslands restored to or maintained in a healthy condition with reduced risk and damage from disturbance processes, both natural and human-controlled.

- **Goal 2 (Grasslands Plan, page 1-4):** Provide a variety of uses, values, products, and services for present and future generations by managing within the capability of sustainable ecosystems.
  - **Goal 2.c (Grasslands Plan, page 1-5):** Improve the capability of the Nation's forests and grasslands to provide a desired sustainable level of uses, values, products, and services.

Demonstration Project

The Grasslands Plan was amended relative to livestock grazing in 2006, and included a pilot Demonstration Project provision initiated for a ten year period (USDA Forest Service 2006). The Demonstration project was renewed in 2017 to reflect the positive results of the initial pilot and to clarify direction for an additional ten years or until such time as a new Grasslands Plan Record of Decision is signed. The Demonstration Project outlines a strategy where grazing associations and Forest Service personnel work cooperatively on planning and monitoring landscape scale vegetation management projects related to grasslands management. One key goal of the Demonstration Project is to seek to minimize livestock grazing reductions, to the maximum extent practicable, while implementing the Grasslands Plan, and to resolve resource management conflicts (USDA Forest Service 2017).

Need for the Proposal

The purpose of this vegetation management project is to serve as an update to allotment management plans and to maintain or improve forage and other resource conditions within the Deep Creek livestock grazing allotments. This area has been brought forward for analysis at this time to comply with the Rescissions Act of 1995 (Public Law 104-19, Section 504), as amended, which requires the Forest Service to establish and adhere to a schedule for completion of National Environmental Policy Act analyses and decisions on all grazing allotments. Specifically, there is a need to incorporate "best available science" that applies to the landscape within these allotments to:

- Refine allotment management strategies, systems, and boundaries to better distribute livestock and forage utilization across the allotment, consistent with Grasslands Plan standards;
- Restore native plant communities and animal species habitat within the allotments to achieve the desired conditions appropriate for the ecological site for vegetation composition and structure; and
- Maintain or improve riparian and woody draw conditions to achieve Grasslands Plan goals and objectives for maintaining long-term soil productivity, properly functioning water cycles, and diverse, native plant and animal communities based on the capabilities of the ecological sites.

Public Involvement

We listed the Deep Creek Vegetation Management Project in the Dakota Prairie Grasslands schedule of proposed actions and mailed a scoping letter in February 2018 to potentially interested individuals, agencies, tribes, businesses, and groups who have expressed a desire to be notified about current projects. The scoping proposal asked for public comment on the proposed action. We received four responses to the scoping letter. Comments were supportive and did not result in issues describing likely effects that would require the refinement of the proposed action or development of alternative ways to meet the purpose and need. A copy of the scoping letter and mailing list, and comments received are included in the planning record and are available upon request.

Pre-decisional Objection Process

The Deep Creek Vegetation Management Project implements a land management plan. The project is subject to pre-decisional objection consistent with the Consolidated Appropriations Act of 2012 (Public Law 112-74) as implemented by subparts A and B of 36 CFR part 218.

Proposed Action and Alternatives

A no-action (no-grazing) alternative, a current management alternative, and the proposed action were considered. Federal agencies are required by the National Environmental Policy Act to rigorously explore and objectively evaluate a range of reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not considered in detail (40 CFR 1502.14). The responsible official did not find a reason to develop any additional alternatives that would achieve the purpose and need for the project. If no unresolved conflicts exists, the environmental assessment need only analyze the proposed action and proceed without consideration of additional topics (36 CFR 220.7(b)(2)(i)). No alternatives for consideration were identified from public scoping comments received.

Alternative 1 – No Grazing

Under the no-action (no-grazing) alternative, no livestock grazing would be authorized in the project area (Forest Service Handbook 2209.13 section 92.31). Domestic livestock grazing permits on National Forest System lands on the 20 allotments would be discontinued within two years' notice to permittees (36 CFR 222.4(a)(1)). Allotment management would continue unchanged during this 2-year period. No new term grazing permits for domestic livestock grazing would be issued.

The utility of existing structural improvements would be examined, and those not needed for wildlife or other purposes outside of livestock grazing would be removed over time. Under this alternative, control of noxious weeds would continue as authorized under the 2007 Noxious Weed Project Final Environmental Impact Statement and Record of Decision (USDA Forest Service 2007), and restoration projects could be planned and implemented in the future.

Alternative 2 – Current Management

Alternative 2 would continue to authorize current livestock numbers and grazing strategies. No changes would occur in the permitted number of livestock, permitted season of use, kind or class of livestock, or grazing system, as identified in Appendix A. This alternative would not include

the initial actions and adaptive options listed in allotment tables in appendix A. Adjustments in authorized numbers and grazing rotations would be made in the annual operating instructions to allow for weather fluctuations such as flood or drought, or the treatment of invasive weeds. No additional range improvements would be developed.

Alternative 3 – Proposed Action

Alternative 3 continues to authorize livestock grazing on the 20 allotments in the Deep Creek project area under an adaptive management strategy designed to meet or move resources toward Grasslands Plan desired conditions. Based on current permitted use, we would authorize up to 8,314 animal unit months (AUMs[2]) of livestock grazing annually on National Forest System lands in the Deep Creek project area. For each allotment, in compliance with the Demonstration Project, we would implement prescribed grazing strategies to maintain or improve vegetation composition, vegetative structure, riparian conditions, and woody draw conditions. The proposed action includes activities and adaptive management tools agreed to by Forest Service and grazing association representatives and includes activities such as installing range infrastructure, adjusting grazing systems, and implementing restoration activities. A detailed description of the proposed action for each grazing allotment is provided in Appendix A. Maps showing the proposed actions for each allotment are provided in Appendix E.

Design Features Common to All Allotments

Our proposed activities are designed with a variety of measures intended to avoid, minimize, or mitigate known or potential adverse effects to various resources. Grasslands Plan standards and guidelines are incorporated into the Deep Creek Vegetation Management Project unless otherwise documented in this environmental assessment. The following project design features may or may not be included in the grasslands plan standards and guidelines or may impose additional project design.

- If monitoring indicates livestock grazing is the cause of a decline in the population of a Forest Service Northern Region sensitive plant species, the population may be fenced, or other protective measures may be applied.
- Locate new water sources away from riparian areas and hardwood draws.
- Locate livestock feeding, supplementing, and pest control away from riparian areas and hardwood draws or where they would have the least adverse effect on the hardwood draws' desired condition, as described in the Grassland Plan geographic area direction. This includes, but is not limited to, the placement of salt, mineral, oilers, creep feeders, urea troughs, fly rub bags, hay, protein cake, etc.
- Conduct active management for invasive species. The Forest Service and partners will follow the Dakota Prairie Grasslands Noxious Weed Management Project Final Environmental Impact Statement and Record of Decision (USDA Forest Service 2007), and applicable Forest Service policy and regulation.
- Implement the Dakota Prairie Grasslands Desk Guide Drought Response Plan (October 23, 2015).

[2] AUM = animal unit month, which equates to one mature cow of approximately 1,000 pounds, either dry or with calf up to 6 months of age, or their equivalent, for a standardized 30 animal-unit days based on a forage allowance of 26 pounds per day on an oven-dry basis.

- Utilize non-native grass units early to defer grazing on native grasses.
- Follow Grasslands Plan direction for all new or reconstructed fences to meet big game specifications. Prioritize and, as funding allows, reconstruct those fences not meeting big game specifications. Install user friendly gates on open roads and trails.
- Maintain, remove or replace range improvements as needed. This includes, but is not limited to, roads and trails, fences, corrals, pipelines, stock tanks, springs, dams, dugouts, and wells.
- Conduct heritage, paleontological, botanical, and wildlife assessments prior to grounddisturbing activities, and if needed, initiate mitigation.
- All persons implementing project activities must be informed that any objects or sites of cultural, paleontological, or scientific value such as historic or prehistoric resources, graves or grave markers, human remains, ruins, cabins, rock art, fossils, or artifacts shall not be damaged, destroyed, removed, moved, or disturbed. If any of the above resources are encountered, the proponent shall immediately suspend all activities in the immediate vicinity and notify the Dakota Prairie Grasslands authorized officer of the findings.

Monitoring and Adaptive Management

The proposed action incorporates adaptive management and the use of an adaptive management toolbox (Appendix C). This approach allows us to account for imperfect information or unanticipated impacts and adapt to changes in environmental conditions. Effects of the individual and cumulative actions can be monitored and changes to management actions can be made if the effects differ from what we predicted. In this way, as environmental conditions vary and change over time, the appropriate tool can be applied to achieve the desired result. Adaptive management changes are temporary or permanent modifications to adjust to changing conditions or to test a revised management approach. Permanent changes would be supported by long-term quantitative or qualitative conditions and trend information.

A key component of adaptive management is monitoring. The proposed action includes a monitoring protocol that is likely to be used to determine whether management changes are needed to allow resource conditions to meet or move toward desired levels. Table 2 displays resources to be monitored, methods used, and frequency of monitoring. Appendix B provides a flowchart of the adaptive management decision process using the monitoring protocol in Table 2.

The Forest Service and the grazing association would be involved in monitoring. If monitoring determines that a change in management is needed, it would consist of pre-defined management options listed in the adaptive management toolbox in Appendix C. This list is not all-inclusive.

New science and management techniques may be incorporated as needed or as they are developed. In some cases, individual potential actions would need to be combined to meet desired conditions or to trend resources toward desired conditions.

Table 2. Resources to be monitored, monitoring methods, and frequency of monitoring for the Deep Creek Vegetation Management Project

Resource to be Monitored	Methods	Frequency[1]
Vegetation composition	Graminoid weight Species presence or absence[2]	Every 10 years

Vegetation composition	Photo points	Every 5 to 10 years
Vegetation composition	Fall pasture tours	Annually
Vegetation structure	Visual obstruction reading at the Grasslands Plan monitoring scale[3]	Review Grasslands Plan monitoring data annually
Vegetation structure	Fall pasture tours	Annually
Riparian condition	Photo points	Every 3 to 5 years
Riparian condition	Proper functioning condition protocol[4]	Every 10 years
Riparian condition	Fall pasture tours	Annually
Riparian condition	Multiple indicators – optional when proper functioning condition assessments raise concerns[5]	Short-term indicators: every 2 to 3 years. Long-term indicators: every 5 to 10 years after baseline transect is established.
Woody draws	Photo points	Every 5 to 10 years
Woody draws	Species presence or absence	Every 10 years
Woody draws	Fall pasture tours	Annually
Sensitive plant populations and habitat	Plant surveys	5 to 10 years in conjunction with Grasslands Plan monitoring, depending upon species
Range infrastructure condition	Routine pasture inspections	Variable throughout the year
Range infrastructure condition	Fall pasture tours	Annually
Grazing impacts or effects to archaeological site sample	Revisit a sample of the archaeological sites used to establish initial or baseline data for the analysis and perform a condition assessment to determine if adaptive management actions are needed	Every 5 years

1 – As funding and staffing levels allow

2 – North Dakota State University cooperative monitoring plots

3 – Vegetative structure, visual obstruction readings will be based on North Dakota State University's recommendations for monitoring visual obstruction readings on biologically capable ecological sites for Major Land Resource Area (MRLA) 54 and 58c

4 – Proper functioning condition (PFC) assessment is used as a way to identify riparian areas that are not functioning properly and pinpoint the factors that may be affecting their health. A PFC protocol is a qualitative assessment based on quantitative science (Prichard et al.1998) and can be used to determine monitored and/or apparent trends.

5 – Multiple indicators monitoring transects may be used as an optional monitoring method in areas where livestock management changes are made with a primary emphasis on improving riparian condition. Only relevant indicators in this monitoring method will be measured.

Environmental Impacts of the Proposed Action and Alternatives

This section summarizes the potential impacts of the proposed action and alternatives for each impacted resource. Resource summaries in this section are based on the environmental analyses conducted by Forest Service resource specialists and documented in individual resource reports

which are located in the planning record and available from the Medora Ranger District. These summaries incorporate by reference the scientific analyses documented in the reports, including the regulatory framework, data and methodologies used in determining potential environmental effects, and detailed analysis discussions of the affected environment and direct, indirect, and cumulative effects of the proposed action and alternatives.

Range Resources

Table 3 displays the resource indicators and measures used to measure and disclose effects to range resources.

Table 3. Resource indicators and measures used to assess effects to range resources

Resource Element	Resource Indicator	Measure
Rangeland vegetation	Ecological site plant community phase (vegetation composition)	Likely change in plant community phase or state
Rangeland vegetation	Noxious weed occurrences	Qualitative assessment of expected increase or decrease in weed infestations
Livestock grazing management	Authorized livestock use	Potential to affect livestock operations, including number of head and grazing system

Summary of the Affected Environment

Rangeland plant communities are dynamic with their composition changing in response to climatic conditions and disturbance regimes. The USDA Natural Resources Conservation Service and their cooperators have developed ecological site descriptions that attempt to describe the composition and ecological function of these plant communities (Sedivec and Printz 2012). Included in the ecological site descriptions are state and transition diagrams which illustrate the current understanding of how these plant communities respond to various disturbance regimes (available online at https://efotg.sc.egov.usda.gov/#/). The state and transition diagrams, along with the ecological dynamics narratives, identify and describe the different plant community states, phases, thresholds, transitional pathways and drivers that may occur on a site. Understanding these dynamics helps us predict how a plant community will respond to changes in management. The plant community phases represent unique assemblages of plants within individual states that are influenced by natural and anthropogenic drivers. The reference plant community phase describes the plant community that would have occupied the site under the historic disturbance regime. This is the plant community that would have had the highest ecological function in terms of hydrology, species diversity and nutrient cycling. The “historic” plant communities are referred to as the “reference state.” One of the plant communities that occurred within the reference state usually is selected as the “reference plant community” phase for inventory and evaluation purposes (Sedivec and Printz 2012).

During the summers of 2011and 2012, North Dakota State University collected baseline vegetative data within the project area in cooperation with the Little Missouri Grazing Association and the Forest Service. Using the ecological site state-and-transition diagrams, each study plot was evaluated to determine which plant community phase was present on that particular ecological site. The project area summary of the existing condition by ecological site is displayed in Table 4. In general, approximately 46 percent of the sites evaluated are in native invaded or invaded states.

Table 4. Project area-wide summary of existing community phases by ecological site

Ecological site (percent of project area, NFS acres only)	Existing community phase	Number of plots	Percent of ecological site in this phase
Clayey (6.6%)	1.3 Excessive litter (Invaded)	1	100
Claypan (2.9%)	1.2 Blue Grama/Western Wheatgrass	1	50
Claypan (2.9%)	3.1 Introduced Bluegrass/Bromes/Shrubs	1	50
Loamy (24.6%)	1.2 Western Wheatgrass/Blue Grama/Sedge	1	3
Loamy (24.6%)	2.1 Western Wheatgrass/Green Needlegrass	2	6
Loamy (24.6%)	2.2 Western Wheatgrass/Blue Grama/Sedge/ Sagewort	3	9
Loamy (24.6%)	2.3 Western Wheatgrass/Kentucky Bluegrass	5	16
Loamy (24.6%)	3.1 Kentucky Bluegrass/Smooth Bromegrass/Shrubs	3	9
Loamy (24.6%)	5 Annual/Pioneer Perennial, Introduced	18	56
Sands (1.5%)	1.3 Excessive Litter (Invaded)	1	50
Sands (1.5%)	2.1 Threadleaf Sedge/Blue Grama	1	50
Sandy (7.6%)	4.1 Exotic cool-season grasses/shrubs	1	50
Sandy (7.6%)	5.1 Annual/Pioneer Perennial	1	50
Shallow Loamy (13.2%)	1.1 Western Wheatgrass/Needlegrass/Plains Muhly	1	5
Shallow Loamy (13.2%)	1.2 Low Plant Density, Excessive Litter	8	40
Shallow Loamy (13.2%)	2.1 Grama/Sedge	4	20
Shallow Loamy (13.2%)	3.1 Club Moss	3	15
Shallow Loamy (13.2%)	Any plant community, Undetermined	4	20
Shallow sandy (0.15%)	2.2 Sedge	1	50
Shallow sandy (0.15%)	4.4 Club Moss	1	50
Thin Claypan (3.9%)	1.1 Western Wheatgrass/Blue Grama	1	14
Thin Claypan (3.9%)	1.2 Low Plant Density	3	43
Thin Claypan (3.9%)	2.1 Blue Grama/Buffalograss	1	14
Thin Claypan (3.9%)	3.1 Club Moss	1	14
Thin Claypan (3.9%)	Native invaded	1	14
Thin Loamy (18.8%)	1.1 Needlegrass/Bluestem/Western Wheatgrass	1	8
Thin Loamy (18.8%)	2.2 Little Bluestem/Grama	3	23
Thin Loamy (18.8%)	3.3 Blue Grama/Sedge	1	8
Thin Loamy (18.8%)	4.4 Excessive Litter	7	54

Thin Loamy (18.8%)	Undetermined	1	8
Very Shallow (11.0%)	1.1 Needleandthread/Little Bluestem/Grama	7	41
Very Shallow (11.0%)	1.2 Low Plant Density	2	12
Very Shallow (11.0%)	2.1 Grama/Sedge	8	47

NFS = National Forest System lands

Within the project area there are approximately 6,090 acres that are dominated by crested wheatgrass. Depending on the ecological site, areas dominated by crested wheatgrass typically fall into the annual/pioneer perennial community phase, unless the ecological site description identifies a specific community phase for crested wheatgrass-dominated sites. Other non-native, invasive grasses found in the project area include Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), cheatgrass (*Bromus tectorum*), and Japanese brome (*Bromus japonicus*).

In addition to these invasive non-native grasses, there are noxious weeds in the project area. The most common noxious weed in the project area is leafy spurge (*Euphorbia esula*). Table 5 displays a summary of the acreages of known infestations in the project area. Most of the acres recorded as known infestations have been treated at least once since 1997; approximately 188 acres of weeds were treated in the project area in 2017.

Table 5. Acres of known noxious weeds in the project area

Noxious weed	Acres of known infestations in the project area (acres treated in the recent past)
Leafy spurge (*Euphorbia esula*)	1,100
Canada thistle (*Cirsium arvense*)	137
Common burdock (*Actium minus*)	12
Musk thistle (*Carduus nutans*)	8
Bull thistle (Cirsium vulgare)	0.7
Hound's tongue (*Cynoglossum officinale*)	0.4
Absinth wormwood (*Artemisia absinthium*)	0.4
Sow thistle (*Sonchus arvensis*)	0.1

Direct and Indirect Effects

Alternative 1 – No Grazing

Ecological site plant community phase

As demonstrated by the Natural Resources Conservation Service state and transition diagrams (USDA NRCS 2012a – 2012i, 2018), heavy continuous grazing or continuous seasonal grazing generally changes a plant community over time to one dissimilar to that described for the reference (or historic) state. The diagrams also show that, in general, applying "prescribed grazing", or returning the natural disturbance regime to the site, moves the community toward the reference state. Under this alternative it is expected there may be some initial movement toward the reference state on some sites. The ecological site descriptions (USDA NRCS 2012a-2012i,

2018) also indicate that on all the sites except the very shallow and thin claypan ecological sites, removing livestock grazing for an extended period (10 years or more) results in plant communities with high litter levels. Plant communities with excessive litter levels tend to be invaded by non-native grasses such as Kentucky bluegrass, crested wheatgrass, and smooth brome. Because the conditions favor these cool-season grasses, they may eventually dominate the plant community. As the invasive, non-native grasses increase, the plant communities move toward an invaded state. A very shallow or thin claypan that is subjected to an extended period of non-use (15 years or more) is expected to move into a plant community phase with low plant density. On such sites, the vigor and diversity of native plants would be reduced. Annual and biennial forbs, annual grasses, and cryptogams commonly fill interspaces once occupied by desirable species. Sites that are currently in invaded states are expected to remain in invaded states. Therefore, with the removal of livestock grazing, the native rangeland plant communities throughout the project area may move towards the reference plant community initially, but, over the long term, removing livestock grazing would result in moving most sites toward native invaded or invaded states.

Table 6 displays the predicted plant community change following extended non-use (10-20 years) for ecological sites on which vegetation data was collected. The existing community phase or state of each site would determine the rate at which these changes might occur.

Table 6. Projected community phases summary by ecological site – no grazing alternative*

Ecological site (percent of total NFS acres in project area)	Projected community phase/state	Number of plots	Percent of ecological site in this phase
Clayey (6.6%)	1.3 Excessive litter (Invaded)	1	100
Claypan (2.9%)	2.0 Native Invaded State	1	50
Claypan (2.9%)	3.1 Introduced Bluegrass/Bromes/Shrubs	1	50
Loamy (24.6%)	2.0 Native Invaded State	1	3
Loamy (24.6%)	3.1 Kentucky Bluegrass/Smooth Bromegrass/Shrubs	13	41
Loamy (24.6%)	5 Annual/Pioneer Perennial, Introduced	18	56
Sands (1.5%)	1.3 Excessive Litter (Invaded)	1	50
Sands (1.5%)	2.1 Threadleaf Sedge/Blue Grama	1	50
Sandy (7.6%)	4.1 Exotic cool-season grasses/shrubs (Invaded)	2	100
Shallow Loamy (13.2%)	1.2 Low Plant Density, Excessive Litter	9	45
Shallow Loamy (13.2%)	2.1 Grama/Sedge	4	20
Shallow Loamy (13.2%)	3.1 Club Moss	3	15
Shallow Loamy (13.2%)	Any plant community, Undetermined	4	20
Shallow sandy (0.15%)	2.2 Sedge	1	50
Shallow sandy (0.15%)	4.4 Club Moss	1	50

Thin Claypan (3.9%)	1.2 Low Plant Density	4	57
Thin Claypan (3.9%)	2.1 Blue Grama/Buffalograss	1	14
Thin Claypan (3.9%)	3.1 Club Moss	1	14
Thin Claypan (3.9%)	Native invaded	1	14
Thin Loamy (18.8%)	4.4 Excessive Litter	13	100
Very Shallow (11.0%)	1.1 Low Plant Density	9	53
Very Shallow (11.0%)	2.1 Grama/Sedge	8	47

NFS = National Forest System lands

* Data were collected from the dominant/co-dominant ecological sites, per North Dakota State University protocol; as a result, there may be minor ecological sites present in the project area for which there are no data. For this analysis, it is assumed that the data available represent the entire allotment.

Noxious weeds

Livestock and associated management activities are known vectors for noxious weed spread; weeds can accidentally become established in new sites through livestock management activities that bring seeds or plant parts into previously un-infested areas and the livestock themselves can be vectors for new infestations. Two of the noxious weeds known to occur in the project area, common burdock and hound's tongue, are particularly easily transported by livestock as they produce prickly burs that attach to the animals. The currently known infestations of those two species are relatively small in the project area, but because of ease with which they spread they could expand substantially. Livestock and the associated management activities can also be a factor in the spread of the predominant weed in the project area, leafy spurge (Ogden and Renz 2005, Messersmith et al. 1985). With removal of grazing from the project area that vector would be removed. However, the infestations that are already established are expected to continue to expand, with or without the influence of livestock grazing. Noxious weeds in the project area are treated as described in the Dakota Prairie Grasslands Noxious Weed Management Project Final Environmental Impact Statement and Record of Decision (USDA Forest Service 2007). Treatment of noxious weeds will continue regardless of this project. However, with no grazing, cooperation with the grazing association would cease to exist, resulting in a reduction in the number of acres monitored and treated annually, and ultimately in an increase in the size of noxious weed infestations.

Authorized livestock use

Under this alternative, there would be no authorized grazing on the National Forest System lands within the project area; no new term grazing permits for domestic livestock grazing would be issued, resulting in a 100 percent reduction in the amount of grazing allocated. This alternative would affect livestock grazing on private lands intermingled within the allotments. If private landowners wanted livestock to graze their private land, they would be responsible for fencing their private land to ensure cattle do not have access to the National Forest System land. Without a grazing agreement in place, lands of other ownership would not be integrated with National Grasslands into a grazing program that demonstrates sound land conservation practices.

Alternative 2 – Current Management

Ecological site plant communities

With a continuation of current management, the plant communities are expected to remain in the community phases they are currently in (as displayed in Table 4). However, without the prescribed grazing, monitoring and adaptive management included in the proposed action, plant communities that are nearing a major threshold may transition to an invaded or shortgrass state.

Noxious weeds

The effects to noxious weed infestations are expected to be the same as that discussed for the proposed action (below), i.e. livestock grazing would continue to be a vector for weed infestation, but cooperative treatment of those infestations would continue.

Authorized livestock use

Many of the existing range improvements in the project area were constructed years ago; sometimes their current location does not mitigate for livestock conflicts with other resources or distribution challenges within the pasture. Without additional fencing or water developments, pastures are not grazed as efficiently and cannot be rested adequately for general rangeland health or other required vegetation management activities.

Under this alternative, if monitoring shows that desired conditions are not being met or satisfactory progress toward meeting the desired conditions is not occurring, and all administrative actions have been exhausted, then the Forest Service has limited flexibility to make changes without completing a new National Environmental Policy Act analysis. Conducting a new analysis each time a change is needed takes considerable time and expense. This inefficiency often leads to on-the-ground management being several steps behind due to the dynamic nature of environmental systems; ultimately, such inefficiency leads to a failure to achieve desired results.

Alternative 3 – Proposed Action

Ecological site plant community phase

Overall, the direct and indirect effects of implementing the proposed action are expected to help move the plant communities toward desired conditions for rangeland vegetation. The state and transition diagrams use “prescribed grazing” as a pathway that can lead to a change in the plant community. The Natural Resources Conservation Service defines prescribed grazing as “…the controlled harvest of vegetation with grazing animals, managed with the intent to achieve a specific objective” (USDA NRCS practice code 528, undated). For this analysis, the proposed action is considered to be prescribed grazing because it includes adaptive management that requires monitoring and the flexibility to change management (using the tools identified in the adaptive management toolbox) to ensure that vegetation composition is moving toward desired conditions.

Monitoring for changes in vegetation composition (species presence or absence) is best done over the long-term (hence the 10 year frequency) because changes in vegetation composition happen slowly, over many years. However, the short-term monitoring protocols (such as photo points, fall pasture tours, visual obstruction readings, some indicators in the multiple indicator monitoring, and routine pasture inspections) are all relevant to effects expected for vegetation composition because they tell us if management is occurring as proposed. The short-term monitoring protocols all help ensure that our management reflects the prescribed grazing identified in the ecological site descriptions, which is the basis for this analysis.

Table 7 summarizes the plant community phases, by ecological site, expected to occur under the proposed action. In general, plant communities on sites that are currently in the reference state are expected to remain in that state with prescribed grazing management. Other plant communities are likely to change phases within the state they are in, but are not likely to move out of their current state. Sites currently in an invaded phase or annual/pioneer perennial phase are expected to remain unchanged in that phase.

Table 7. Projected community phases summary by ecological site – proposed action*

Ecological site (percent of total NFS acres in project area)	Projected community phase	Number of plots	Percent of ecological site in this phase
Clayey (6.6%)	1.3 Excessive litter (Invaded)	1	100
Claypan (2.9%)	1.1 Western Wheatgrass/Blue Grama/Needlegrasses	1	50
Claypan (2.9%)	3.1 Introduced Bluegrass/Bromes/Shrubs	1	50
Loamy (24.6%)	1.1 Western Wheatgrass/Green Needlegrass	1	3
Loamy (24.6%)	2.1 Western Wheatgrass/Green Needlegrass	10	31
Loamy (24.6%)	3.1 Kentucky Bluegrass/Smooth Bromegrass/Shrubs	3	9
Loamy (24.6%)	5 Annual/Pioneer Perennial, Introduced	18	56
Sands (1.5%)	1.2 Needleandthread/Threadleaf Sedge/Blue Grama	1	50
Sands (1.5%)	2.1 Threadleaf Sedge/Blue Grama	1	50
Sandy (7.6%)	4.1 Exotic cool-season grasses/shrubs (Invaded)	2	100
Shallow Loamy (13.2%)	1.1 Western Wheatgrass/Needlegrass/Plains Muhly	9	45
Shallow Loamy (13.2%)	2.1 Grama/Sedge	4	20
Shallow Loamy (13.2%)	3.1 Club Moss	3	15
Shallow Loamy (13.2%)	Any plant community, Undetermined	4	20
Shallow sandy (0.15%)	2.2 Sedge	1	50
Shallow sandy (0.15%)	4.4 Club Moss	1	50
Thin Claypan (3.9%)	1.1 Western Wheatgrass/Blue Grama	4	57
Thin Claypan (3.9%)	2.1 Blue Grama/Buffalograss	1	14
Thin Claypan (3.9%)	3.1 Club Moss	1	14
Thin Claypan (3.9%)	Native invaded	1	14
Thin Loamy (18.8%)	1.1 Needlegrass/Bluestem/Western Wheatgrass	3	23

Thin Loamy (18.8%)	2.2 Little Bluestem/Grama	1	8
Thin Loamy (18.8%)	3.3 Blue Grama/Sedge	2	15
Thin Loamy (18.8%)	4.4 Excessive Litter (Invaded)	6	46
Thin Loamy (18.8%)	Undetermined	1	8
Very Shallow (11.0%)	1.1 Needleandthread/Little Bluestem/Grama	9	53
Very Shallow (11.0%)	2.1 Grama/Sedge	8	47

NFS = National Forest System lands

*; Data were collected from the dominant/co-dominant ecological sites, per North Dakota State University protocol; as a result, there may be minor ecological sites present in the project area for which there are no data. For this analysis, it is assumed that the data available represent the entire allotment.

Implementation of the adaptive management tools

Adjusting the livestock stocking levels is a valuable grazing management tool because the level of stocking is always a major factor affecting the condition of rangeland resources (Holechek et al. 1988). Under the proposed action, with the adaptive management component in place, stocking could be adjusted annually, as needed, to take into account the effect of natural processes (e.g., drought, wildfires, hail, floods, and grasshoppers) on forage availability and resource conditions. As noted in Appendix C, the use of tools that adjust the stocking rate or stocking levels would be utilized only after implementation of other tools has failed to meet objectives, and in compliance with the Demonstration Project, “There will be no cuts in permitted AUMs without monitoring showing that livestock are principally responsible for not meeting the desired condition, and that the cuts are the only ecologically practicable and economically feasible means available for meeting the desired condition” (USDA Forest Service 2017).

Altering season of use or implementing grazing systems would allow species to be grazed at different phenological stages. By adjusting the season of use, the plants have the opportunity to initiate growth without the stresses of grazing or the opportunity to recovery without grazing. Utilizing rotational grazing systems ensures the plants are not grazed during the same phenological stage every year, again, allowing initial growth and recovery. Incorporating rest into a grazing system allows plants to complete their entire life cycle without the stresses that may be associated with defoliation. This can affect the plant community by providing those plants associated with different phases the opportunity to recover from grazing pressure.

The tools that are designed to alter livestock distribution can be used to move animals away from an area, or to attract animals to an area. These tools can be useful for ensuring more homogeneity of an area (by spreading the utilization throughout the area) or they can be used to create more heterogeneity of an area (by concentrating utilization in some areas while reducing utilization in other areas). Altering the distribution of livestock use can affect the plant communities by reducing the grazing pressure in an area to allow plant recovery, or increasing the grazing pressure in an area to prevent litter build up.

Some adaptive management tools are designed to manipulate vegetation directly or are needed to address other resource concerns. Interseeding or reseeding with native species has the greatest potential to affect plant community phases. If areas that are currently in an invaded or annual/pioneer perennial phase are reseeded with native species they may move from their current state. For example, the state and transition diagram for loamy ecological sites shows us that with a successful seeding and appropriate grazing management, a site in plant community phase 3.1

could move out of the invaded grass state into the native invaded state (plant community phases 2.1, 2.2 and 2.3) (USDA NRCS 2012c).

Prescribed burning, herbicide and mechanical methods can be used to control the accumulation of plant litter, to decrease conditions for invasive grasses, to regenerate decadent crested wheatgrass areas and reduce encroachment by woody species. If prescribed burning is identified as a needed tool, a site specific burn plan would be developed and approved prior to prescribed burning activities.

There are also several tools that can be used to increase palatability and utilization of crested wheatgrass. Fertilizing crested wheatgrass can increase the production of these areas (Smolaik and Johnston 1981). In addition, harvesting crested wheatgrass as hay, or simply cutting the crested wheatgrass and leaving it on site, can increase the palatability (the regrowth is more palatable). Increasing the palatability and utilization of crested wheatgrass can be used as a livestock distribution tool as the treated areas may be more attractive to cattle, decreasing grazing pressure on the native grasses. These crested wheatgrass management tools may not directly alter the species composition of the crested wheatgrass areas themselves, but could indirectly improve the composition on surrounding rangeland sites by modifying livestock distribution and reducing grazing pressure, providing deferment, or rest.

Club moss plant community phases (i.e. community phase 4.4 on shallow sandy sites, community phase 3.1 on thin claypan sites) can be very resistant to change (this is displayed in the state and transition diagrams by the identification of a club moss state). Mechanical renovation is identified as a restoration pathway that can help move a site that is in a club moss state towards the reference state (USDA NRCS 2012g). Including ‘scarify clubmoss areas within a pasture’ in the toolbox provides the tool needed to mechanically renovate such areas and move them toward the reference state.

Noxious weeds

Weeds can accidentally become established in new sites through livestock management activities that bring seeds or plant parts into previously un-infested areas and the livestock themselves can be vectors for new infestations, as discussed under alternative 1. With a continuation of grazing in the project area, the cooperative treatment of noxious weeds would continue, thus, the effects to noxious weed infestations from the proposed action are expected to be similar to the existing condition, i.e. livestock grazing would continue to be a vector for weed infestation, but cooperative treatment of those infestations would continue.

Authorized livestock use

The proposed action identifies specific structural improvements or management for some allotments. These tools would facilitate an improvement in the livestock management on those allotments, while retaining the current stocking levels. Under this alternative, authorized grazing levels would remain as identified in the existing condition. However, adaptive management is a component of this alternative, so there would be the potential for the stocking to decrease project area-wide, if objectives are not being met. As noted in the adaptive management toolbox the use of tools that adjust the stocking rate or stocking level would be utilized only after implementation of other tools failed to meet objectives and in compliance with the Demonstration Project, “There will be no cuts in permitted AUMs without monitoring showing that livestock are principally responsible for not meeting the desired condition, and that the cuts are the only ecologically practicable and economically feasible means available for meeting the desired condition” (USDA Forest Service 2017). Overall, the proposed action is expected to improve livestock management

and move the conditions on these allotments toward the desired objectives, while retaining the existing stocking levels.

Including adaptive management as a component of the proposed action increases the flexibility of livestock management. Because monitoring would occur and adjustments made to management if objectives are not being met, progress would be made toward achieving management objectives.

Implementation of Tools from Adaptive Management Toolbox

Tools for manipulating the season of use or implementing grazing systems as well as those affecting livestock distribution provide flexibility for meeting management objectives and are expected to help improve livestock management.

Fertilizing, haying, and interseeding could affect the authorized use by requiring that cattle be removed from the area during implementation. For interseeding the deferment from grazing would be extended until the seedlings are well established. They all also have the potential to ultimately increase the forage production of the area in the long term.

Structural Range Improvements

Structural improvements are proposed in many of the project allotments. Making these repairs or changes would help improve the overall grazing management on these allotments. Water sources that function properly and fences in advantageous locations help distribute the grazing pressure, drawing grazing animals out of riparian areas, and facilitate rotational grazing. The use of rotational grazing and managing the distribution of the grazing pressure are important tools for achieving the herbaceous vegetation structural objectives identified by the Grasslands Plan and for enhancing or protecting sensitive areas. Adaptive options would also be available to help improve livestock management when issues are identified. With monitoring and the flexibility to change management, the conditions on those allotments would move toward the desired objectives.

Cumulative Effects

Ecological Site Plant Community Phase and Noxious Weeds

Although there are no management activities proposed under the no grazing alternative, as discussed under *Environment Consequences Alternative 1 – No Grazing*, there are effects expected from this lack of action. Those effects identified, when combined with the effects from other present and foreseeable future activities, could add incrementally to the increase of nonnative grasses and noxious weeds, resulting in more land areas trending towards invaded plant community phases in the project area.

Because the effects to the rangeland vegetation from the proposed action and current management alternative are both very slight, neither the proposed action nor alternative 2 is expected to add incrementally to impacts. Neither of the action alternatives is expected to add incrementally to noxious weed infestations as the effects from both those alternatives is a continuation of the existing conditions.

Authorized Livestock Use

The proposed action and the current management alternative are expected to improve or maintain livestock management without reducing the stocking levels, so they would not add incrementally to the impacts to livestock management.

Climate change

Effects of climate change on this project

There is still a great deal of uncertainty as to the direction and magnitude of vegetative changes that may occur due to climate change. However, it is considered likely that there will be an increase in extremes, such as higher air temperatures, changes in precipitation regimes, longer, more frequent drought, shorter fire return intervals, and continued increase in atmospheric pressure (Brown 2008). There will likely be shifts in species distributions and ranges. In addition, there could be a benefit to cool season grasses as elevated carbon dioxide levels increase wateruse efficiency (Brown 2008). Because of the uncertainties involved, adaptive management is considered an effective tool for dealing with climate change on the landscape (Brennan 2008).

Effects of this project on climate change

It is accepted that methane gas from ruminants contributes to the greenhouse gasses that accelerate climate change (Brown 2008). Therefore, this analysis looks at how the alternatives may contribute to methane production.

An adult ruminant emits between 55 to 110 kilograms of methane annually or 5 to 9 kilograms per month. One kilogram equals 0.001 metric ton. Therefore, one adult cow for one month would result in between 0.005 and 0.009 metric ton of methane. There are approximately 100 million cattle in the United States, which emit about 5.5 million metric tons of methane per year[3].

Given the large range in individual animal methane output, the methane production for this project was calculated showing both the high estimate (0.009 metric ton) and low estimate (0.005 metric ton) of monthly methane output by a cow (Table 8). A spreadsheet detailing the calculations is included in the project record.

Table 8. Estimated methane production calculated for Deep Creek project alternative actions

Alternative	Project area federal AUMs	Metric tons methane project area-wide	Percent of national annual methane production
Alternative 1 - No Grazing	0	0	0
Alternative 2 – Current Management	8,314	42 - 75	0.0008% - 0.0014%
Alternative 3 – Proposed Action	8,314	42 - 75	0.0008% - 0.0014%

It is estimated that the range of methane emitted by authorized livestock grazing in the project area would contribute very little to the production of methane on a national level. This analysis assumes that a reduction in livestock numbers on the National Forest System lands would result in an actual reduction in the number of livestock. However, there is no way to determine that the cattle removed from the National Forest System lands would not simply graze elsewhere. Therefore, it is not possible to be certain that there would be an actual reduction in methane production. If the ranch operation in question does not reduce its overall number of livestock and continues to raise the same number using other feed or private pasture sources, there would be no net effect in reduction of methane gasses.

[3] (http://www.epa.gov/oecaagct/anprgbmp.html)

It is also important to note that given the lack of Federal standards related to greenhouse gas emissions, any data and conclusions developed through quantitative analysis methods are used only for the comparison of alternatives. Without sufficient scientific understanding to draw conclusions about the significance of the quantitative results, it is not meaningful to disclose more than this.

Another consideration related to climate change is carbon sequestration. The Environmental Protection Agency recognizes that improved livestock management can help reduce atmospheric concentrations of carbon dioxide through the mechanism of soil carbon sequestration on grazing lands. Even though plant material is harvested by grazing animals, with grazing management, the residues accumulate and increase the amount of organic matter in the soil, where it remains instead of being released back into the atmosphere as carbon dioxide (US EPA 2007). The no grazing alternative would result in the most vegetative residue remaining, and therefore, the most carbon sequestration in the project area. Because the proposed action includes adaptive management and livestock management is expected to improve, it is expected to result in increased carbon sequestration, over the existing condition.

Woody Draws

Green ash (*Fraxinus pennsylvanica*) and its associated ecological sites occur throughout the Dakota Prairie Grasslands Little Missouri National Grassland, in which they are the most common broadleaf tree community. These communities, generally occurring in drainage bottoms in narrow bands often less than 100 feet wide, are often called woody draws. Grasslands Plan goals, objectives, and desired condition statements describe a situation where 80 percent of woody draws are at or moving toward desired conditions of multi-layered and multi-aged woody draw habitats that have thick and brushy understories. For this analysis, woody draw conditions are assessed through expected vegetation responses in woody draw ecological sites and plant community phases.

Summary of the Affected Environment

Fifty seven plots within 23 project area woody draws were sampled during the 2016 growing season using the protocol for determining community phases of wooded draws on the Little Missouri National Grassland using ecological site descriptions (Butler 2016). Three provisional woody draw ecological site descriptions (USDA NRCS 2016a-c) and their state and transition models were used to describe the existing condition of the woody draws sampled. Table 9 summarizes the state and plant community phase data of the sampled project area woody draws. Appendix B of the Deep Creek Vegetation Project Woody Draw Report contains a comprehensive summary of project area woody draw survey data by allotment (project record).

Table 9. Summary of project area existing community phases by ecological site for woody draws

Ecological Site	Existing community phase	Number of plots
Flat bottom	2.3 Native/invaded state	5
Flat bottom	3.1 Invaded	14
Loamy overflow	3.1 Herbaceous invaded state	7
Loamy overflow	4.2 Invaded woody state	18
Steep sided	1.2 Reference state	3

Steep sided	2.1 Native/invaded state	10

Comprehensive studies across the Little Missouri National Grassland indicate that a considerable portion of woody draw communities are in a declining condition and do not meet desired conditions as defined in the current Grasslands Plan (USDA Forest Service 2001, Duxbury 2009, Jensen 1997, 1991). Project area survey results indicate that woody draws on flat bottom and loamy overflow sites were either in a native/invaded state or an invaded state and are not meeting or moving toward Grasslands Plan objectives. Native/invaded state is similar in appearance to the reference state plant community phases and is characterized by a decreasing presence of green ash in the herbaceous, shrub, and eventually the sapling layers. This state has also been invaded by exotic cool-season grasses and forbs. The presence of Kentucky bluegrass (*Poa pratensis*) has the greatest effect on the ecological processes such as green ash seedling recruitment and restoration potential due to its ability to form a dense sod and thatch layer which inhibits seed to soil contact (USDA NRCS 2016a-c).

Surveys also indicate that project area woody draws are being affected by plant diseases and pests such as white stringy heartrot fungus, ash bark beetles, and forest tent caterpillars, which have impacted the health of the green ash component of these communities. Although deer and elk populations are not at excessive levels in the project area, browsing by these animals contributes to the currently observed low amounts of successful tree regeneration. Excessive livestock disturbances are cited as the most obvious causal factor contributing to poor woody draw conditions (Bjugstad and Girard 1984, Boldt et al. 1978, Butler 1983, Butler and Goetz 1984, Girard et al. 1987, Lesica and Marlow 2011, Uresk et al. 2009).

Direct and Indirect Effects

Alternative 1 – No Grazing

Discontinuing livestock grazing may enhance green ash recruitment and shoot growth in woody draws that are in reference or native/invaded states (Lesica and Marlow 2011, Uresk 1987), but growth could be limited by exotic graminoid species curtailing germination and seedling survival, and browsing by wild ungulates. The project area woody draws may move towards improved conditions with increasing density and structural complexity of the canopy layers (Lesica and Marlow 2013, Lesica 2009).

Table 10. Summary of projected community phases of woody draws for the no grazing alternative

Ecological Site	Current State and Community Phase	Alternative 1
Flat Bottom	5 plots in 2.3 native/invaded state	Short term, through community phase pathway 2.3A – rest would enhance green ash seedling recruitment resulting in a shift to plant community Phase 2.1. Long term – with rest, a transition to state 3.0 would occur without mechanical or chemical treatments of exotic graminoids.
Flat Bottom	14 plots in 3.1 herbaceous invaded state	Mechanical or chemical treatments would be needed to break up the Kentucky bluegrass sod, followed by seeding or transplanting shade tolerant native herbaceous species, chokecherry, and possibly snowberry. Prescribed fire may be needed to stimulate sprouting of the shrubs.

Loamy Overflow	7 plots in 3.1 herbaceous invaded state	No retrogression would occur without mechanical or chemical treatments and transplanting green ash.
Loamy Overflow	18 plots in 4.2 invaded woody state	Short term – with rest there would be a community pathway change to community phase 4.1. Long term – with rest, a transition to state 3.0 would occur without mechanical or chemical treatments of exotic graminoids.
Steep Sided	3 plots in 1.2 reference state	With long term rest and normal to above normal precipitation, there would be potential to return these woody draws to the reference plant community phase 1.1 and move them towards desired conditions.
Steep Sided	10 plots in 2.1 native/invaded state	Retrogression back to the reference state would not occur without mechanical treatment and prescribed fire.

However; the flat bottom and loamy overflow woody draws in the native/invaded state would likely see improvement in the short term (5 to 10 years), but longer term (over 10 years), without mechanical or chemical treatment, would transition into an invaded state. Once this transition occurs, restoration would be difficult, requiring either a coincidence of increasingly unlikely biological and environmental conditions or large expenditures of time and money. Table 10 illustrates the effects that removing grazing would cause to project area woody draws.

Alternative 2 – Current Management

Livestock grazing can affect woody draws by limiting regeneration of woody species. Repeated browsing and mechanical damage to tree and shrub saplings decreases vigor and inhibits advancement to later growth stages. The slow growth response of woody plants to browsing and trampling disturbances can impede or stunt their rate of growth and ability to escape additional disturbances, with sufficiently repeated browsing causing mortality. The project area woody draws in a native/invaded or invaded state would not return to the reference state and desired community phase without restoration. Lesica (2009) indicated that even restoration would be difficult, requiring either a coincidence of increasingly unlikely biological and environmental conditions or large expenditures of time and money.

Based on the existing condition of the woody draws, and that exotic graminoid species are present, there would be no change or movement towards Grasslands Plan desired conditions and objectives. Table 11 illustrates the effects alternative 2 would have on the existing conditions of project area woody draws.

Table 11. Summary of projected community phases of woody draws for the current management alternative

Ecological Site	Current State and Community Phase	Alternative 2
Flat Bottom	5 plots in 2.3 native/invaded state	Long-term continuous grazing and loafing by domestic livestock would likely transition this to a herbaceous invaded state (state 3.0).
Flat Bottom	14 plots in 3.1 herbaceous invaded state	Major agents of change would be needed for transition to the reference state.
Loamy Overflow	7 plots in 3.1 herbaceous invaded state	No retrogression would occur without mechanical or chemical treatments and transplanting green ash.

Loamy Overflow	18 plots in 4.2 invaded woody state	Some level of managed grazing would be needed for this state and community phase to shift to plant community phase 4.1 through community phase pathway 4.2A. However, lack of fire and conditions are favorable for the establishment Rocky Mountain juniper which would initiate a shift to plant community phase 4.3.
Steep Sided	3 plots in 1.2 reference state	With normal to above normal precipitation, there would be potential to return these woody draws to the reference plant community phase 1.1 and move them towards desired conditions.
Steep Sided	10 plots in 2.1 native/invaded state	Retrogression back to the reference state would not occur without mechanical treatment and prescribed fire.

Alternative 3 – Proposed Action

General effects due to livestock grazing would be the same as discussed in alternative 2 under current management.

Table 12. Likely actions required to move woody draws towards Grasslands Plan desired conditions

Ecological Site	Current State and Community Phase	Alternative 3
Flat Bottom	5 plots in 2.3 native/invaded state	Under conditions of normal precipitation and disturbance regime, green ash seedling recruitment would be enhanced with the implementation of properly planned periods of deferment or rest from grazing, resulting in a shift to plant community phase 2.1.
Flat Bottom	14 plots in 3.1 herbaceous invaded state	Major agents of change would be needed for transition to the reference state. Mechanical or chemical treatments would be needed to break up the Kentucky bluegrass sod, followed by seeding or transplanting shade tolerant native herbaceous species, chokecherry, and possibly snowberry. Prescribed fire may be needed to stimulate sprouting of the shrubs. Once well-established, shrubs would help with snow catchment and provide protection for young green ash. Green ash may need to be transplanted; transplanted trees > 2 meters in height would allow them to avoid most browsing pressure. This pathway would likely result in a shift towards plant community phase 2.3.
Loamy Overflow	7 plots in 3.1 herbaceous invaded state	A transition to state 4.0 could be initiated by removal of disturbance, including grazing and fire. A transition to state 2.0 could be initiated with the combination of prescribed burning, initially implemented at short intervals, followed by high levels of prescribed grazing. The success of this restoration pathway depends on the presence of a remnant population of native grasses in community phase 3.1.
Loamy Overflow	18 plots in 4.2 invaded woody state	Some level of managed grazing would be needed for this state and community phase to shift to plant community phase 4.1 through community phase pathway 4.2A. Alteration of the grazing regime would inhibit Kentucky bluegrass and allow for sprouting shrubs which, over time would provide an environment favorable for green ash regeneration.

Steep Sided	3 plots in 1.2 reference state	Above normal to normal precipitation would generate conditions favorable for germination and establishment of green ash seedlings, which would ultimately re-establish the multi-aged and multi-layered structure of green ash and return the site to the reference plant community phase 1.1. The survival and growth of green ash in the herbaceous and shrub layers is enhanced by high cover of chokecherry that reduces the potential damage from browsing ungulates on lesser slopes.
Steep Sided	10 plots in 2.1 native/invaded state	Mechanical treatment and prescribed fire would shift this back to state 1, likely to plant community phase 1.3. Mechanical treatment of juniper, if present, may be required to maintain the remnant green ash component of the plant community.

Proposed cross fences and water developments would be implemented to improve livestock distribution, pulling them away from draw bottoms and allowing herd managers easier control of forage utilization across the allotments. Improvement to woody draws would depend on the effectiveness of the range improvements and overall number of grazing animals present. Use of adaptive management tools would generally improve the ability of the range to achieve desired vegetation conditions, including woody draws. Effects of the adaptive management tools have been addressed in the North Billings County Allotment Management Plan Revisions Final Environmental Impact Statement (USDA Forest Service 2014a) on the Medora Ranger District, and the Pastures 2, 10, and 11 Vegetation Management Project Environmental Assessment (USDA Forest Service 2016) and Pastures 3 and 5 Vegetation Management Project Environmental Assessment (USDA Forest Service 2018a) on the McKenzie Ranger District and are incorporated here by reference.

Of the 10 steep sided woody draws sampled, seven were in a native/invaded state and three were in the reference state. None of the steep sided plots were within the desired community phase that would meet Grasslands Plan desired conditions. However, there is potential for three of the plots to move towards the desired community phase with normal to above normal precipitation. This would generate conditions favorable for germination and establishment of green ash seedlings which would re-establish multi-aged and multi-layered structure. Individual plots within the 2.1 state and community phase have a similar appearance to the reference state; however, exotic cool season grasses and forbs are part of the community. Major management changes would be required to move this community towards the desired condition. Prescribed grazing alone would not bring this state and community phase back into the reference state.

With the exception of the steep sided woody draws currently in plant community phase 1.2, the proposed initial actions alone would not effect a retrogression back to the reference state for woody draws in a native invaded or invaded state. Because exotic graminoid species are present, to transition to the reference state these woody draws would require either a coincidence of increasingly unlikely biological and environmental conditions or large expenditures of time and money. Site specific use of adaptive management tools would have the potential to transition woody draws toward Grasslands Plan goals and objectives, as illustrated in Table 12.

Cumulative Effects

Cumulative impacts on woody draws would be variable in direction and intensity of effects, depending on the activities implemented and future environmental conditions. Treatment of

noxious weeds is expected to continue in the project area, which would help to maintain ecological conditions and prevent potential for noxious weed competition with woody species.

Extended drought may have an adverse effect on green ash regeneration and probably enhances other problems such as crown die-back (Lesica and Marlow 2013). Drought and grazing often have similar effects on rangeland, causing an increase of more drought-tolerant, grazing-adapted species and a decline in tree seedling recruitment. The Dakota Prairie Grasslands Desk Guide Drought Response Plan (October 23, 2015) would be implemented during drought.

The effects of climate change on upland plant communities are considered in the Deep Creek Vegetation Management Project Range Report (USDA Forest Service 2018b). Climatic changes characterized by decreases in precipitation and increases in temperature and the frequency of extreme climatic events could make recruitment of green ash from seed a less common occurrence here at the arid edge of the tree's geographic range (Lesica and Marlow 2013). Increases in precipitation would likely benefit woody species by providing an environment with more available soil moisture. These changes are not expected to be a major influence on woody draws during the next 15 years.

Sensitive Plants

Table 13 displays the resource indicators and measures used to measure and disclose effects to sensitive plants.

Table 13. Resource indicators and measures used to assess effects to sensitive plants

Resource Element	Resource Indicator	Measure
Sensitive plant condition	Abundance	Would there be no change, an increase, or a decrease in the species abundance?
Sensitive plant habitat	Suitable habitat	Would there be no change, an increase, or a decrease in the amount or quality of suitable habitats?
Sensitive plants	Species viability	Determination category

Summary of the Affected Environment

Fourteen sensitive plant species are known or suspected for the Little Missouri National Grassland and are presented in appendix A of the Sensitive Plants Specialist Report and Biological Evaluation (project record), with their preferred habitats, number of documented occurrences, and levels of threat from grazing activities. Known sensitive plant species occurrences in the Deep Creek project area include one alkali sacaton (*Sporobolus airoides*), one Dakota buckwheat (*Eriogonum visheri*) population, one nodding buckwheat (*Eriogonum cernuum*), one Missouri foxtail cactus (*Escobaria missouriensis*), one Townsendia species (*Townsendia sp*), and one sand lily (*Leucocrinum montanum*) population.

Direct and Indirect Effects

All alternatives may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to sensitive plant populations or species occurring within the Deep Creek project area. The determination was based on the presence and amount of exotic species within the project area (see plant community phases, as illustrated in the state-andtransition diagrams in the ecological site descriptions, and similarity index in the Deep Creek Vegetation Management Project Range Report (USDA Forest Service 2018b)) and the location of the sensitive species occurrences.

Alternative 1 – No Grazing

Removal of grazing would benefit all occurrences by eliminating the incidental disturbances they are currently experiencing. Even though there would be some benefit, populations are not expected to increase or decrease. However, all sensitive plant species occurrences may be impacted in the long term by the increase of invasive graminoid and forb species.

The removal of livestock grazing would have minimal impact on smooth goosefoot, Torrey's cryptantha, Dakota buckwheat, nodding buckwheat, dwarf mentzelia, and alyssumleaf phlox because the habitats supporting these sensitive plant species are characterized by poorly developed soils, low forage production, and rugged terrain where livestock spend little time grazing. Removal of grazing would not likely change the trend or viability of these species, but there would be some benefit by eliminating incidental trampling and grazing impacts.

Missouri foxtail, sand lily, lanceleaf cottonwood, alkali sacaton, and Easter daisy, which have greater quantities of forage in their habitats and are more likely to be eaten or trampled by livestock, would benefit from the removal of livestock as there would be no effects from livestock trampling or herbivory. However, increased structure and plant competition could contribute adverse effects to some species. For instance, sand lily favors shortgrass habitat such as early seral blue grama communities, and a gradual shift toward mid and tall grasses in these communities would have the potential to displace sand lily or adversely affect habitat conditions through increased structure and shading. Increased structure and shading could also crowd out individual Hooker’s townsendia plants due to their short stature, but would likely not put entire populations at risk. The condition of lanceleaf cottonwood habitats would likely improve, but it is unknown whether this species would become established in the project area.

Blue-eyed Mary habitats would experience no disturbances from grazing, which means that any undiscovered occurrences would benefit from the lack of plant damage. But, any benefit to habitat maintenance from livestock grazing and trampling of invading Kentucky bluegrass would be lost.

No initial increase or decrease in non-native invasive grasses is expected with alternative 1, so there would be no immediate change to this aspect of sensitive plant habitat conditions. Over time, established infestations are expected to continue to expand, with or without the influence of livestock grazing, and would result in an increase in the size of non-native invasive plant infestations in the long-term (USDA Forest Service 2018b). This increased competition within sensitive plant habitats could reduce the suitability of these habitats.

Movement of noxious weeds would likely decrease with the elimination of livestock as a transport vector. Soil disturbance from livestock would also be eliminated, and this may result in fewer noxious weeds becoming established (USDA Forest Service 2014b). Heavily trampled areas would begin to recover and may eventually resist being dominated by weedy species.

Alternative 2 – Current Management

No serious adverse impacts directly related to livestock grazing were noted among existing sensitive plant populations in the project area. The probability of livestock damaging the known sensitive plants is relatively low due to open habitats or small plant size. Some incidental damage could occur to individuals through trampling or herbivory, but these damages are not expected to result in substantial loss of individuals.

Livestock spend little time grazing in areas of rugged terrain, low forage production, and poorly developed soils that characterize habitats for smooth goosefoot, Torrey's cryptantha, Dakota buckwheat, nodding buckwheat, dwarf mentzelia, and alyssumleaf phlox. Livestock alter these habitats very little other than populations located near livestock trails, where there is some possibility of associated transport and growth of invasive species. Continuing current stocking levels would, therefore, have minimal influence on these sensitive plant species and their habitats. Although some incidental damage to individuals or degradation of habitat due to trailing would occur, these impacts would be localized, infrequent, and negligible in terms of maintaining these sensitive plant habitats.

Missouri foxtail, sand lily, lanceleaf cottonwood, alkali sacaton, and Easter daisy have a moderate chance of interaction with livestock grazing because they occur in habitats with higher forage production, where cattle are likely to spend more time. A mix of adverse and beneficial effects would be expected. These habitats would experience soil disturbance from livestock trampling, but conversely, grazing would reduce the height of grasses, which in turn would reduce their competition for light, allowing space for these sensitive plants to become established or be maintained.

Hooker’s daisy can grow in habitats intermediate between the scarce vegetation and fully productive areas just mentioned, and thus, livestock impacts are low to moderate for this species.

Blue-eyed Mary generally inhabits shaded, mesic habitats, attractive to livestock for their shelter from wind and sun, and more succulent forage; therefore grazing impacts to these habitats is moderately likely. The main threats from livestock are from physical disturbance, through herbivory or trampling. Individuals could be killed and seed production greatly reduced from the resulting mortality and plant damage. On the other hand, livestock disturbances may confer a benefit to the species through grazing of Kentucky bluegrass that is common in the woody draw understories, thereby impeding the development of herbaceous structure and litter accumulation that could potentially inhibit growth of the small and relatively delicate blue lips. Annual plant species such as blue-eyed Mary and others can be especially sensitive to a variety of random environmental factors unrelated to the influence of grazing pressure. Thus, the extirpation of individual sensitive plant populations remains an inherent possibility.

In addition to the major effects of herbivory and trampling, some unlucky individuals of any of the small-statured sensitive species could be covered in manure, with possible results of mortality from smothering or causing hardship while attempting to survive under the piles. Those that do survive such an onslaught may fare well due to increased nutrient availability.

Although no changes would occur in current management, annual movement of supplements resulting in improved livestock distribution would potentially relieve a small amount of grazing pressure to the more attractive habitats including riparian areas, floodplains, and woody draws.

Effects of livestock management relating to the spread and dispersal of invasive species have the potential to adversely affect several sensitive plant species and potential habitat through increased competition, plant structure, and alteration of ecosystem processes Even though reducing or eliminating a noxious weed from sensitive plant habitat is beneficial, collateral herbicide impacts can adversely affect sensitive species and native plants when treating noxious weeds.

Alternative 3 – Proposed Action

Field surveys would be conducted prior to proposed ground disturbing projects to identify and mitigate adverse impacts to sensitive plant populations or unique habitat conditions. Adverse

impacts to sensitive plant populations are therefore avoided with at least a moderate degree of confidence.

There would be no initial reduction in stocking rates under alternative 3, so effects due to livestock grazing would be the same as discussed in alternative 2 under current management. However, alternative 3 includes initial actions and adaptive management options which could have an effect on sensitive plants. Activities such as constructing fences and managing placement of water developments and salt and supplement locations are expected to result in improved livestock distribution, which would relieve a small amount of grazing pressure to habitats such as riparian areas, floodplains, and woody draws. Livestock exclusion through temporary or permanent fencing and resting allotments could benefit certain sensitive plant populations as a result of removing grazing disturbances. Overall, current levels of grazing would still occur, so the benefit to sensitive plant habitats would be small. Other adaptive management tools would generally improve livestock distribution, timing, and range conditions, providing small amounts of additional benefits to sensitive plant habitats. These management tools would generally improve the ability of the range, including woody draws, to achieve desired vegetation conditions.

No increase or decrease in noxious weeds are expected; however, exotic grasses such as Kentucky bluegrass may increase with implementation of alternative 3. Exotic species would continue to play a role in suitable habitat and increased competition for species with habitats with naturally moderate to low plant cover, and would also continue to add competition from surrounding communities in habitats with higher vegetation cover.

Cumulative Effects

There is no difference between the alternatives with regard to cumulative effects. When we add the effects of the alternative for Deep Creek Vegetation Management Project to the effects from past, present, and reasonably foreseeable activities and environmental conditions, sensitive plants would experience total effects of relatively low intensity over the next 15 years. These total effects are not expected to result in loss of viability of any of the sensitive plant species.

Treatment of noxious weeds is expected to continue in the project area. Such treatment would help maintain good ecological conditions, and prevent possible future effects from competition with sensitive plants.

The effects of climate change on upland plant communities are considered in the Deep Creek Vegetation Management Project Range Report (USDA Forest Service 2018b). Extended drought may have an adverse effect on sensitive plant species. Changes in precipitation regimes and longer, more frequent drought would likely shift species distributions and ranges, which could result in decreased plant vigor and seed production. An increase in precipitation could benefit sensitive plants by providing additional soil moisture and increased growth. These changes are not expected to be a major influence on sensitive plants over the next 15 years.

Wildlife Resources

The proposed action may impact or affect wildlife and wildlife habitat of threatened, endangered, sensitive, management indicator species, and other wildlife species of concern. A key habitat component for grassland wildlife is herbaceous vegetative structure as it relates most notably to sufficient nesting cover for grassland birds, as well as breeding habitat for butterflies, adequate forage, and other habitat requirements for multiple wildlife species. This analysis summarizes

each alternative's potential to meet vegetative structure objectives and likely effects of the alternative actions to wildlife species and their habitats. More detailed information is provided in the project biological assessment and evaluation located in the project record.

Summary of the Affected Environment

Herbaceous vegetation structure is used on the Little Missouri National Grassland as a measure of the availability of habitat for sharp-tailed grouse, grassland birds, and other wildlife. The Grasslands Plan has established herbaceous vegetation structure objectives intended to provide habitat for a diversity of wildlife and grassland birds. Visual obstruction readings are a measure of the height and density of vegetation and are used to determine if management is meeting Grasslands Plan vegetative structure objectives. Herbaceous structure, as measured using the visual obstruction readings method (described by Robel et al. (1970) and Benkobi et al. (2000)), has been collected during 8 years since 2005 in various intensities and sites within the project area. All sampled sites were dominated by herbaceous vegetation and considered biologically capable of producing high structure. Monitoring data and computations are included in the project record. Results indicate that herbaceous structure has varied appreciably since data collection and monitoring commenced 11 years ago (Table 14).

Table 14. Vegetative structure measured as visual obstruction readings in the Deep Creek project area

Visual Obstruction Readings Class Survey Year	Low Structure (percent) 10-20	Moderate Structure (percent) 50-70	High Structure (percent) 20-30
2005	47.99	51.10	0.92
2006	24.40	74.78	0.83
2008	39.58	59.01	1.41
2009	24.44	74.26	1.30
2010	10.40	82.20	7.40
2012	42.59	55.56	1.85
2015	9.30	76.20	14.50
2017	65.28	34.72	0.00

Structure objectives have not been met across years, particularly for high structure. Figure 2 shows the plotted mean visual obstruction reading trends closely with the annual percent of normal precipitation, indicating that precipitation may be a significant predictor of herbaceous structure. Drier years typically result in an excess of low structure, which is to be expected with precipitation limiting plant growth. In normal or wet periods however, there has often been an excess of moderate structure. This may be due to relatively uniform grazing intensity and distribution within pastures or a lack of plant species composition diversity or overabundance of invasive grasses resulting in a uniformity of vegetative structure.

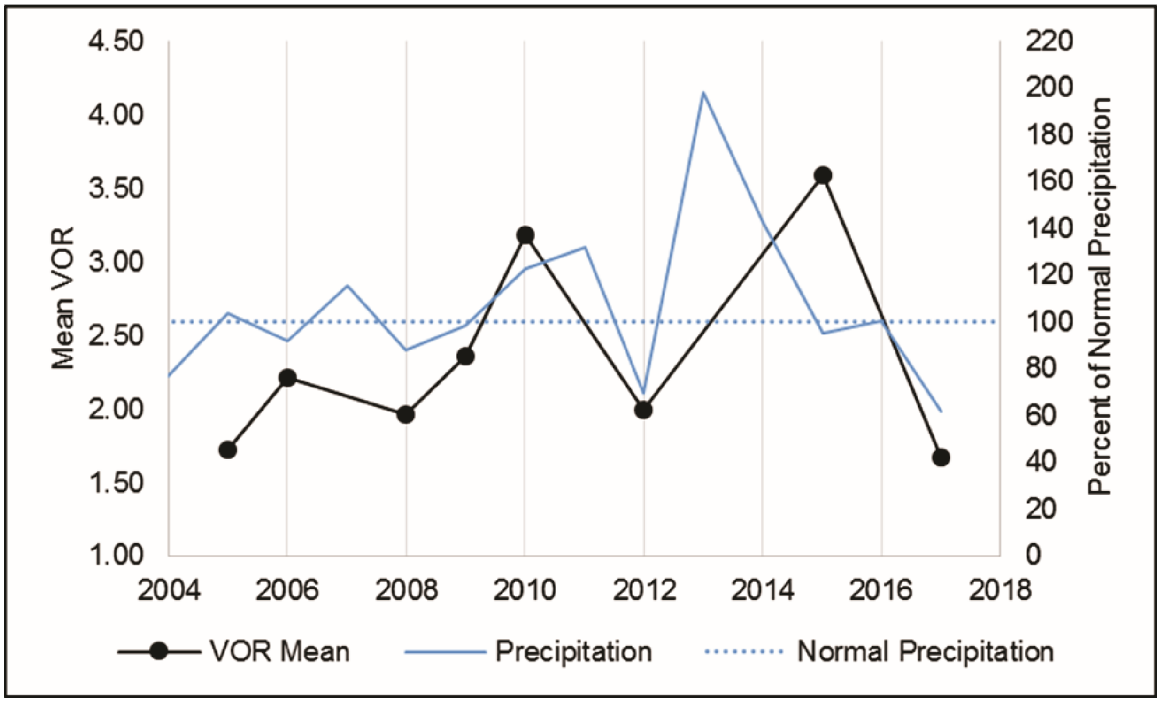

Figure 2. Mean Visual Obstruction Readings (VOR) and precipitation in the Deep Creek project area from 2004 through 2018

Direct and Indirect Effects

Alternative 1 – No Grazing

Herbaceous Vegetation Structure

Without grazing, the effects to vegetative structure would likely be an increase in high structure in the short term. However, removing livestock grazing for an extended period (10 to 20+ years) results in plant communities with high litter levels. Plant communities with excessive litter levels tend to be invaded by non-native grasses such as Kentucky bluegrass, crested wheatgrass, and smooth brome. Because the conditions favor these cool-season grasses, they may eventually dominate the plant community (USDA Forest Service 2018b). This would likely adversely impact native prairie obligate species in the long term.

Wildlife Species

If no-grazing were implemented in the project area, the absence of livestock would result in vegetative communities initially moving towards the reference plant community, but, over the long term, removing livestock grazing would result in moving most sites toward native invaded or invaded states (USDA Forest Service 2018b). Without grazing, in the short term, some wildlife species such as sharp-tailed grouse could benefit due to the increase in cover and nesting habitat. In the long term, there would likely be a reduction in low structure habitats which could adversely impact species such as long-billed curlew that prefer low structure vegetation. Further, no grazing would likely result in excessive litter build-up and unchecked expansion of invasive species, adversely impacting native prairie obligate species such as Sprague's pipit.

Alternative 2 – Current Management

Herbaceous Vegetation Structure

If current management continues, vegetative structure objectives would not likely be met either in the short term or long term, as indicated through past monitoring results.

Wildlife Species

Continuing current management would not be expected to change the condition of resources in the project area, and potential habitat and species occurrences would likely remain stable. Without the ability to adapt to changing conditions, there is little opportunity to improve the condition of vegetation structure or wildlife habitat within the allotments. If current management continues, there would be no change to the current and on-going impacts to wildlife and habitats from current management actions.

Alternative 3 – Proposed Action

Herbaceous Vegetation Structure

Grazing is the primary management action directly affecting vegetative structure. The proposed action includes site specific actions that may affect vegetative structure. The construction of new infrastructure including fences and stock tanks can change the distribution of grazing within a pasture resulting in localized increases or decreases in grazing pressure. Areas with increased grazing pressure would likely trend toward low vegetative structure and areas with decreased grazing pressure would likely trend toward high structure. Similarly, any adaptive management tool or action that alters the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use would also affect vegetative structure. The effects from site specific actions and adaptive management tools would vary with season, year, precipitation, soils, and plant community composition.

When considered in the broader spatial context of the whole allotment, a change in the overall structural composition may occur or there may be no significant net change. Presumably, an adaptive management approach would allow the implementation of management tools tailored to a given allotment or pasture to achieve desired effects and meet management objectives.

Overall, in the short term, the proposed action would result in site specific changes in vegetative structure resulting from changes in the distribution and intensity of grazing. In the long term, the proposed action may help meet vegetative structure objectives.

Wildlife Species

Threatened and Endangered Species

There is no suitable habitat and no observation of threatened or endangered species that potentially occur on the Little Missouri National Grassland. Therefore there is no potential for effects to threatened or endangered species as a result of project activities.

Forest Service Sensitive Species

Effects to Forest Service sensitive species having potential habitat and occurrences within the project area are considered below.

Baird's Sparrow (*Ammodramus bairdii*)

The proposed action includes site specific actions that may impact Baird’s sparrows. The construction of new infrastructure including fences and stock tanks can change the distribution of

grazing within a pasture resulting in localized increases or decreases in grazing pressure. Areas with increased grazing pressure may be avoided by Baird's sparrows. Increased grazing in nesting habitat could also result in disturbances or trampling of nests. Further, installation of infrastructure could result in temporary disturbances to individual Baird's sparrows from human presence and noise. Similarly, any adaptive management tool or action that alters the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use may impact Baird's sparrows or habitat. However, if adaptive management actions are successful in meeting vegetative structure objectives, controlling shrub encroachment, and suppressing invasive species, Baird's sparrow would likely see an increase in suitable habitat.

Site specific actions may impact Baird's sparrow, however, the intent of the proposed action is to improve grassland conditions and meet Grasslands Plan objectives. In the long-term, the proposed action may help promote habitat resulting in a beneficial impact for Baird's sparrow.

Black-tailed Prairie Dog (*Cynomys ludovicianus*)

The proposed action includes site specific actions that may impact black-tailed prairie dogs in allotment 022. The construction of new infrastructure including fences and stock tanks can change the distribution of grazing within a pasture resulting in localized increases or decreases in grazing pressure. Areas with increased grazing pressure may promote prairie dog colony expansion or persistence. Similarly, any adaptive management tool or action that alters the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use may alter habitat potential for prairie dogs.

Construction and installation activities of range infrastructure such as pipelines may result in disturbance or mortality of individual prairie dogs and temporary impacts to habitat. However, such impacts would not likely appreciably impact the prairie dog population.

Site specific actions may have insignificant impacts on black-tailed prairie dogs or habitat and may temporarily promote or impede colony expansion. The proposed action is expected to have no impact on black-tailed prairie dog populations.

Burrowing Owl (*Athene cunicularia*)

The proposed action includes site specific actions that may impact burrowing owls. Installation and construction of range infrastructure could result in disturbances to individual burrowing owls from human presence and noise. Further, any ground disturbing activities within prairie dog colonies could result in disturbance or destruction of nesting habitats, and potential take of burrowing owls. These impacts would be mitigated by distance and timing limitations (Grasslands Plan page 1-17) on such activities during the nesting season. Management actions or tools that only change the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use are not expected to have any significant impacts on burrowing owls.

The prairie dog colony in allotment 022, which is the only known burrowing owl habitat in the project area, is included as part of planned prairie dog control actions on the Little Missouri National Grassland. This colony is planned to be completely eradicated, and implementation of prairie dog control is expected prior to implementation of the proposed action. If burrowing owls continue to occupy habitat in allotment 022 post-prairie dog control, mitigation measures described above would still be implemented as appropriate.

Site specific actions may have temporary impacts to burrowing owls, however, these impacts would be mitigated as appropriate. The proposed action is expected to have no impact on burrowing owls.

Loggerhead Shrike (*Lanius ludovicianus*)

Site specific actions such as the installation of new range infrastructure may cause temporary disturbances to loggerhead shrikes due to human presence and noise. Changes in the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use are not likely to significantly impact loggerhead shrikes.

Site specific actions may impact but are not likely to adversely impact loggerhead shrike.

Long-billed Curlew (*Numenius americanus*)

The proposed action includes site specific actions that may impact long-billed curlew. The construction of new infrastructure including fences and stock tanks can change the distribution of grazing within a pasture resulting in localized increases or decreases in grazing pressure. Such changes could alter localized distributions of preferred habitat. Similarly, any adaptive management tool or action that alters the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use may impact long-billed curlew habitats. Further, installation of infrastructure could result in temporary disturbances to individual curlews from human presence and noise.

Site specific actions may impact but are not likely to adversely impact long-billed curlew.

Ottoe Skipper (*Hesperia ottoe*)

The proposed action includes site specific actions that may impact Ottoe skipper. The construction of new infrastructure including fences and stock tanks can change the distribution of grazing within a pasture resulting in localized increases or decreases in grazing pressure. Areas with increased grazing pressure may be avoided by Ottoe skippers. Similarly, any adaptive management tool or action that alters the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use may impact Ottoe skippers or habitat.

Site specific actions may impact Ottoe skippers but are not likely to adversely impact populations or result in a trend toward federal listing.

Sprague's Pipit (*Anthus spragueii*)

The proposed action includes site specific actions that may impact Sprague’s pipits. The construction of new infrastructure including fences and stock tanks can change the distribution of grazing within a pasture resulting in localized increases or decreases in grazing pressure. Changes in grazing could alter habitats. Further, installation of infrastructure could result in temporary disturbances to individuals from human presence and noise. Similarly, any adaptive management tool or action that alters the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use may impact Sprague’s pipits or habitat. However, the project area contains very little high quality habitat for Sprague’s pipits.

The current conditions within the analysis area provide very little potential suitable habitat for Sprague’s pipit. Site specific actions may impact but are not likely to adversely impact Sprague’s pipit.

Management Indicator Species

Management indicator species for the Little Missouri National Grassland include black-tailed prairie dogs, greater sage-grouse, and sharp-tailed grouse. Greater sage-grouse is also a Forest

Service sensitive species, but has no suitable habitat and no observations within the project area so there is no potential for effects. Black-tailed prairie dog is a Forest Service sensitive species and is addressed in the previous section. Effects to sharp-tailed grouse are summarized below.

Sharp-tailed Grouse (*Tympanuchus phasianellus*)

The proposed action includes site specific actions that may impact sharp-tailed grouse. Site specific actions such as the installation of new range infrastructure may cause temporary disturbances to leks due to human presence and noise. These impacts could be mitigated as appropriate with timing limitations.

The construction of new infrastructure including fences and stock tanks can change the distribution of grazing within a pasture resulting in localized increases or decreases in grazing pressure. Similarly, some adaptive management tools would alter the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use. Increased grazing in nesting habitat could result in a reduction in nesting cover and increased risk of predation, as well as disturbances or trampling of nests. However, these impacts would likely be temporary as grouse are tolerant of grazing on the landscape and would adjust to the localized changes.

In the long term, if adaptive management actions are successful in meeting vegetative structure objectives, sharp-tailed grouse would likely see an increase in suitable nesting habitat.

Site specific actions may impact sharp-tailed grouse in the short term. Impacts to leks would be mitigated as appropriate. In the long-term, the proposed action may help to meet vegetation structure objectives, promoting habitat and resulting in a beneficial impact for sharp-tailed grouse.

Raptors

Effects to raptor species that are specifically addressed in the Grasslands Plan and have potentially suitable habitat or observations within the analysis area are considered below.

Ferruginous Hawk (*Buteo regalis*)

The proposed action includes site specific actions that may impact ferruginous hawks. Installation and construction of range infrastructure could result in disturbances to hawk nesting sites from human presence and noise. These impacts would be mitigated by distance and timing limitations (Grasslands Plan page 1-17) on such activities during the nesting season. Management actions or tools that only change the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use are not expected to have any significant impacts on ferruginous hawks.

Site specific actions may have temporary impacts to ferruginous hawks, however, these impacts would be mitigated as appropriate. The proposed action is expected to have no impact on ferruginous hawks.

Golden Eagle (*Aquila chrysaetos*)

The proposed action includes site specific actions that may impact golden eagles. Installation and construction of range infrastructure could result in disturbances to eagle nesting sites from human presence and noise. These impacts would be mitigated by distance and timing limitations (Grasslands Plan page 1-17) on such activities during the nesting season. Management actions or tools that only change the distribution, timing, and intensity of grazing such as changing stocking

rates, grazing rotations, or season of use are not expected to have any significant impacts on golden eagles.

Site specific actions may have temporary impacts to golden eagles, however, these impacts would be mitigated as appropriate. The proposed action is expected to have no impact on golden eagles.

Prairie Falcon (*Falco mexicanus*)

The proposed action includes site specific actions that may impact prairie falcons. Installation and construction of range infrastructure could result in disturbances to falcon nesting sites from human presence and noise. These impacts would be mitigated by distance and timing limitations (Grasslands Plan page 1-17) on such activities during the nesting season. Management actions or tools that only change the distribution, timing, and intensity of grazing such as changing stocking rates, grazing rotations, or season of use are not expected to have any significant impacts on prairie falcons.

Site specific actions may have temporary impacts to prairie falcons, however, these impacts would be mitigated as appropriate. The proposed action is expected to have no impact on prairie falcons.

Migratory Birds

The national grasslands and forests on the Northern Great Plains provide important seasonal habitat for many migratory bird species. Practically every acre of National Forest System land and water is habitat for one or more species of migratory birds including numerous species of songbirds, migratory raptors, shorebirds, waterfowl, and other water birds (USDA Forest Service 2001b). Although site specific actions may impact some species of migratory birds in the short term, the intent of the proposed action is to improve grassland conditions which if successful could result in beneficial impacts for many migratory bird species in the long term.

Cumulative Effects

Alternative 1 – No Grazing

Under the no action (no grazing) alternative, current grazing would cease. The proposed prairie dog control in allotment 022 is expected to result in complete eradication of the colony. Therefore the alternative addressed here will not have additive cumulative effects for prairie dogs. Prairie dog control could also potentially impact burrowing owls and Ferruginous hawks. However, the no action alternative would have no impact on these species. Therefore, there would be no cumulative effects from this alternative.

Alternatives 2 and 3

For both the current management and the proposed action alternatives, grazing would remain a part of management. The proposed prairie dog control in allotment 022, the only prairie dog colony in the analysis area, is expected to result in complete eradication of the colony. Therefore, there would be no additive cumulative effects for prairie dogs. Prairie dog control could also potentially impact burrowing owls and Ferruginous hawks. Presumably species such as burrowing owls, which depend on prairie dog colonies for habitat, will seek out existing habitat outside of the Deep Creek planning area. Potential effects to burrowing owls and Ferruginous hawks resulting from site specific proposed actions would be mitigated, therefore current or proposed grazing and vegetation management would not additively affect these species. There would be no cumulative effects to wildlife.

Riparian Resources

Proper functioning condition protocol (Prichard et al. 1998) was used to determine likely changes in the condition of riparian areas under each alternative. Grasslands Plan objectives include meeting or moving toward proper functioning condition on at least 80 percent of perennial streams.

Summary of the Affected Environment

Riparian conditions along intermittent[4] and perennial[5] streams in the project area were evaluated using proper functioning condition protocol (Prichard et al. 1998) in 1998, 2012 and 2016. A total of 19 stream reaches within nine allotments were assessed for riparian function and condition. Of the 23.88 miles assessed, only 3.68 miles (15 percent of the reaches assessed) were found to be functioning at risk. One stream reach in West Fork Deep Creek and one reach in East Fork Deep Creek were assessed as functioning-at-risk as a result of grazing pressure and trailing within the riparian area.

Direct and Indirect Effects

Alternative 1 – No Grazing

In the absence of livestock, vegetative cover in and adjacent to riparian areas would likely increase, potentially stabilizing soils, reducing erosion, and improving streambank conditions. If increases of vegetative cover are native grass species, this would result in improved infiltration of precipitation, which reduces runoff and erosion and is beneficial to riparian areas. Conversely, vegetative cover composed of noxious or invasive plant species would impair infiltration of precipitation, resulting in increased surface runoff and erosion and degraded riparian conditions. Generally, the riparian areas currently affected by the presence of livestock would be expected to improve in condition and those that are properly functioning would be expected to remain so.

Alternative 2 – Current Management

With a continuation of current management, riparian conditions are expected to remain in the condition they are currently in. Those stream reaches found to be functioning at risk would likely remain below proper functioning condition due to lack of flexibility of management options and less likelihood to improve livestock distribution away from riparian areas. The location and condition of many of the existing range improvements in the project area does not mitigate for the impacts of livestock management to riparian resources. Without additional water developments, fencing, hardened stream crossings, and the ability to adapt to changing conditions, there is little opportunity to improve the condition of riparian ecosystems.

Alternative 3 – Proposed Action

[4] A stream or stretch of stream which flows only at certain periods of the year when it receives water from springs, discharge from groundwater, or melting snow in mountainous areas. These streams generally flow continuously at least one month most years.

[5] A stream or stretch of stream that flows continuously for most of most years. Perennial streams are generally fed in part by springs or discharge from groundwater. Perennial streams are distinguished from larger rivers by size. Streams wider than 50 feet (15 meters) are considered rivers for the purpose of this inventory.

There would be no initial reduction in stocking rates with alternative 3, so effects due to livestock densities would remain the same as existing conditions in this regard.

Segments of riparian areas within allotments 008, 094, and 110 were found to be either in proper functioning condition with some areas of negative impacts from grazing or functional at risk attributed to heavy browsing and trailing in the riparian area. Implementation of project design criteria and monitoring riparian conditions within the allotments would minimize negative impacts of grazing and benefit riparian resources. Although overall Deep Creek riparian areas are in proper functioning condition, incorporation of the following initial and adaptive management actions would maintain or improve riparian systems.

Altering season of use, implementing various grazing systems, and constructing fence around riparian areas are practices that can be employed to avoid use of riparian pastures when soils are saturated or when the temperatures are extremely high and cattle are looking for shade. Damage to riparian areas can be severe when animals loaf for extended periods in the riparian area (Wyman et. al. 2006). When the soil is wet, hoof action of cattle may cause mechanical damage resulting in shearing or sloughing of stream banks or higher susceptibility to compaction (Jensen et. al. 2016). These practices may also allow for plant regrowth, seed and root production, and litter accumulation, all which benefit the riparian area by filtering and trapping runoff, recharging groundwater and reducing erosion. These types of adaptive management strategies are recommended in allotments 008, 056 and 094 to improve vegetative cover if initial actions don't improve vegetation composition to desired conditions.

Water, salt, and supplement management inherently involve intentional aggregation of livestock. Adaptive management tools can be used to move animals away from riparian areas and distribute negative effects from grazing across an entire allotment. Locating water sources and livestock feeding, supplementing, and pest control away from riparian corridors or where livestock are not required to cross riparian corridors to access them would reduce livestock use in riparian areas. Initial proposed actions in allotments 008, 094, and 110 include installation of pipelines to new stock tanks where stream segments were rated as functioning at risk due to heavy grazing pressure along the channels. Construction of these water developments would benefit the riparian areas and stream reaches through minimizing bank trailing, trampling, and loafing in the riparian areas, allowing for herbaceous and woody riparian vegetation maintenance, and ultimately improving functioning condition. Water developments are also proposed in allotments 012, 044, 085, and 095 to draw livestock away from riparian corridors and maintain proper functioning condition. Improving an existing well in allotment 056 could be used to draw livestock away from Deep Creek, which is currently the only source of water in the allotment. Initial actions to manage supplement locations are proposed for allotment 085, and would likely benefit riparian ecosystems associated with the West Branch of Deep Creek.

Allotments 012, 023, 085, 090, and 110 include initial proposed actions to remove water developments that are no longer needed for livestock grazing. Reclaiming developed springs or various reservoirs along or within drainages has the potential to improve soil conditions in adjacent riparian areas by decreasing livestock disturbances and restoring natural hydrologic conditions that can increase the growth and regeneration of woody species. Healthy and diverse riparian vegetation filters contaminants and excess sediment from entering the stream, and provides protection to the banks during periods of high flows.

Constructing or hardening stream crossings and constructing water gaps to facilitate livestock and authorized vehicle use would limit access and minimize impacts from degradation of stream

banks and sedimentation. Building hardened crossings to provide more secure footing for animals and a gentler streambank can concentrate animals and minimize animal impacts along streams (Massman 1998). Initial proposals to create hardened crossings in allotments 012, 044, 056, and 087 would help to protect riparian conditions.

Cumulative Effects

Plugging abandoned water wells in the project area will occur as abandoned well locations on National Forest System lands are found. No cumulative effects to riparian resources are expected because the proposed alternatives would benefit or maintain current conditions and because closing abandoned wells has a very small footprint and only temporarily disturbs vegetation at the site. Seeding and erosion control would eliminate any effects that could potentially occur at abandoned well sites.

Soil Resources

Forest Service Region 1 guidance directs that no more than 15 percent of an activity area can have greater than 15 percent cumulative detrimental soil disturbance (USDA Forest Service 2014c). Detrimental soil disturbances analysis was used to examine how each alternative would affect soil health. The analysis uses range infrastructure such as reservoirs, stock tanks, mineral sites and trailing, to determine the acreage of soil disturbance within the project area. Calculations used to measure disturbance parameters are included in Appendix A of the Deep Creek Vegetation Management Project Soil Resources Report.

Summary of the Affected Environment

Actions that may affect soils include creating or removing range structures, building or removing fences, prescribed burning, prescribed mowing, prescribed grazing, and soil stabilization activities. These activities mainly contribute to how much compaction and surface erosion are present in the project area. Table 15 summarizes the existing acres of disturbance calculated within the project area allotments.

Table 15. Current project area acres of soil disturbance

Disturbance Areas	Existing condition
Stock tanks and water wells (acres)	10.8
Reservoirs, Dugouts, and waterlots (acres)	66.0
Mineral sites (acres)	8.7
Corrals (acres)	1.0
Livestock trails (acres)	26.0
Unauthorized roads and trails (acres)	59.0
Total acres disturbed	171.5
Percent disturbance	0.9

Direct and Indirect Effects

General Effects of Grazing on Soils

Numerous studies have shown that soil surface ground cover is a major factor in erosion. Wood and Blackburn (1981), McCalla et al. (1984a, b), and Lusby (1965), reported that standing vegetation, litter, bare ground, total ground cover, bulk density, initial soil moisture content, organic matter content, and rock cover all had some influence on infiltration, runoff, and sediment yield. Dadkhah and Gifford (1980) stated that the most important factor influencing sediment production was grass cover and that 50 percent protective ground cover was sufficient to provide adequate soil stabilization.

Areas where compaction is likely to occur due to reduced ground cover from grazing include watering sites, salting locations, bedding ground locations, trailing paths, or other areas of extensive use (Hausenbuiller 1985). These areas generally represent very small isolated soil disturbances within allotments. Soils in these areas are compacted and have increased susceptibility to wind and water erosion due to reduced vegetative cover and increased bare ground (Clary and Leininger 2000).

Soils in riparian areas are especially susceptible to stream bank trampling, soil puddling, and erosion damage where concentrated use is associated with watering and bedding sites. As livestock range across the landscape, minor compaction can occur over broader areas, but it seldom causes long-term degradation. Compaction from livestock is generally a short-term impact, as the effect is often controlled by root action, frost-heave action, and the shrink-swell capacity of the soil.

Alternative 1 – No Grazing

The removal of livestock would eliminate disturbance from livestock trailing and soil disturbance related to livestock presence around range infrastructure. Disturbed soils in the project area would be reduced from the existing 171.5 acres to 59 acres. The soil disturbance quality standards of less than 15 percent disturbance would be maintained and soils that have been negatively impacted due to livestock would recover.

Alternative 2 – Current Management

Although no range improvements would be developed or removed under the current management alternative, this alternative would support adjustments in the annual operating instructions for authorized numbers and grazing rotations to allow for weather fluctuations such as flood or drought, or the treatment of invasive weeds. Continuing current management would not appreciably change the amount of range infrastructure or livestock patterns in the project area, and therefore is not expected to increase or decrease the amount of disturbed soils. Without the adaptive management options proposed under alternative 3, vegetation condition could degrade under changing conditions, which in turn could negatively impact soil condition.

Alternative 3 – Proposed Action

Livestock management proposed for alternative 3 would use approximately the same type and amount of range infrastructure as is currently utilized and is not expected to increase the amount of disturbed soils in the project area to any great degree. Alternative 3 activities are not expected to contribute to any measurable increase in the amount of soil disturbance than what already exists in the area. Maintaining or replacing infrastructure would aid in improving livestock movement, which in turn, would help to minimize soil compaction. Generally, when new infrastructure is established, old developments that are no longer needed would be removed. Adaptive management options are designed to improve resource conditions, and as such, acres of detrimental soils would likely decrease as adaptive options are implemented. Initially, the

proposed action would remove 3 reservoirs and increase the number of stock tanks by 17 in order to distribute livestock and improve vegetation recovery. Because the acreage disturbed by the reservoirs is larger than the acreage disturbed by stock tanks, there would be a slight increase in overall soil disturbance of about 8 acres. Over the life of the project, the total disturbed soils would remain well under 15 percent of the project area, and would comply with Region 1 supplemental direction to the Forest Service Manual.

Cumulative Effects

For all alternatives, detrimental soil disturbance would remain below one percent in the project area and would not contribute to cumulative effects. Any future work in the project area would not be permitted to exceed the level where detrimental disturbance thresholds would be exceeded. If necessary, mitigation measures would be implemented to ensure the guidance is met.

Heritage Resources

Any federal undertaking, such as ground disturbing activities, that has the potential to affect heritage resources must be evaluated for impact to cultural resources (42 USC 4332 § 102(c); 42 USC 4331 §101(b)). The proposed action includes ground disturbing activities that have the potential for direct impacts from ground disturbance and indirect impacts by changing the travel patterns of livestock that could in turn impact archaeological resources. A site identification strategy would be used for all new ground disturbing activities within the project area to determine areas requiring archaeological survey and the intensity level of the survey.

Approximately 4 percent of the project area has been surveyed for archaeological resources. For areas with previous adequate surveys, where heritage resources were identified, potential effects of the disturbance would be assessed and mitigation and avoidance measures would be employed. Where cultural heritage sites are identified, the State Historic Preservation Offices would be consulted in compliance with Section 106 of the National Historic Preservation Act.

Where there is no previous heritage survey, a proportionate survey, centered on the proposed disturbance, would be conducted. These site-specific project activities generally disturb less than 100 acres, therefore the entire potential area of effect would be inventoried. Any cultural heritage sites recorded during these surveys would be mitigated through avoidance and redesign of the project improvements. These actions would be tracked and reported in the annual report to the State Historic Preservation Offices. This, along with Forest Service Handbook and Manual direction, ensure adequate analysis and evaluation of impacts to heritage resources.

Direct and Indirect Effects

Alternative 1 – No Grazing

As a result of no cattle grazing activity, historic properties would be subject to natural deterioration, decay and stratigraphic disturbance only.

Alternative 2 – Current Management

Historic properties would be subject to natural deterioration, decay and stratigraphic disturbance as a result of cattle grazing activity as it is currently managed. Cattle grazing activity can disturb and destroy prehistoric and historic properties by moving artifacts within the soil. Erosion created by cattle trails and wallows would be exacerbated by natural elements over time, creating false patterns of artifact occurrence and impairing the ability to interpret what occurred or how people

lived in the past. There would be no extensive stratigraphic disturbance as a result of management actions.

Alternative 3 – Proposed Action

The proposed action has the potential to alter livestock distribution within allotments. This could result in positive impacts to archaeological sites by moving livestock away from areas with higher potential for cultural heritage resources, or negative impacts by dispersing livestock to areas that currently have little or no livestock use. Direct impacts of site specific activities would be mitigated with avoidance measures and redesign of the project improvements.

Cumulative Effects

Provided compliance measures are met and heritage resources are avoided, there would be no effect to heritage resources resulting from any of the alternatives. As a result, no cumulative effects would be expected.

Socioeconomics

Livestock grazing has economic and social importance in the study area. Allotments support agricultural jobs and income as well as the ranching way of life that supports long-standing family traditions. Communities surrounding the project area have historical ties to agriculture. Assessing employment and income in the study area aids in the identification of those industries important to the economic sustainability of the region, and those potentially dependent on the activities taking place on National Forest System lands.

Each of the 20 allotments are located in Slope County, North Dakota, but social and economic linkages between these allotments extend beyond county lines. Livestock operators authorized to graze on the project area allotments also rely on goods and services purchased from neighboring business centers in Bowman County, North Dakota. To analyze how changes in the management of livestock grazing on these allotments may affect local communities, the study area for socioeconomics considerations includes both Slope and Bowman counties.

Summary of the Affected Environment

In 2016, the study area was reported to support 3,157 jobs in 126 different industries. The largest employing sector in the study area was Agriculture, Forestry, Fish & Hunting, accounting for 21.1 percent of total employment. The study area has a significantly higher percentage of total employment in this sector when compared to statewide employment statistics, where the agriculture sector only accounted for 6.2 percent of North Dakota's total employment in 2016 (IMPLAN 2016). [6]

Of the 668 local jobs in the Agriculture, Forestry, Fish & Hunting sector, the beef cattle ranching and farming industry accounted for the largest share of employment, supporting 233 jobs (35 percent). Comparing this to North Dakota as a whole, where beef cattle ranching and farming makes up only 19 percent of agriculture sector employment, illustrates the relative importance of livestock grazing to the local economy. Additionally, employment in the beef cattle ranching and farming industry is often much higher than reported by traditional labor statistics, as labor

[6] Employment data were obtained from the IMPLAN Group, which reports annual economic data for all counties in the United States. The most current IMPLAN data available is 2016, which is the data used throughout this analysis. IMPLAN uses national, state, and local data sources to report county-level

statistics only reflect hired employment. When labor contributions of unpaid family workers are considered alongside those of hired agricultural workers, the agricultural sector is revealed to play an even larger role in the study area.

Labor income within the two-county study area totaled $135 million in 2016. Approximately 14 percent of these labor earnings are attributed to the agricultural sector, which includes the beef cattle ranching and farming industry (U.S. Department of Commerce 2017).

Many ranching operations and families rely on public lands as a necessary source of forage for livestock grazing. Although forage provided by federal lands may account for only a small portion of the feed needed to support local herds, public land forage is used part of the year to offset more expensive hay and grain feed.

Direct and Indirect Effects

Alternative 1 – No Grazing

Economic Condition

The elimination of livestock grazing on the 20 project area allotments would directly affect employment associated with ranching operations, and indirectly affect industries that supply materials, equipment, and services to ranches, and also personal spending by the ranch owners, employees, families, and supporting industries. This alternative would create a change in current conditions, potentially resulting in a reduction of 13 jobs and $540,000 in labor income currently supported by livestock grazing on these national grasslands. Additionally, non-monetary benefits associated with restoration activities under Alternative 3 (watershed, wildlife habitat, and vegetation improvement) would not take place.

Social Environment

As described above, agriculture accounts for 21 percent of study area employment, but only 14 percent of study area labor income. This finding suggests that individuals who work in the agriculture sector have relatively low incomes. This raises the possibility of environmental justice consequences. The cost of eliminating grazing on National Forest System lands could fall most heavily on individuals more vulnerable to economic change.

Although forage provided by project area allotments may account for only a small portion of the annual forage needed to support local herds, it offsets more expensive hay and grain feed during critical times of the year. Without access to federal forage, many producers may be forced to reduce their herd sizes or cease livestock production all together. Shifts away from these

employment, and includes full-time, part-time, seasonal, and self-employment. Therefore, IMPLAN employment data is reported simply as jobs, not full-time equivalents. Thus, one person with multiple jobs will show up more than once in the data.

longstanding agricultural land uses may threaten traditional values of local ranchers and inhibit the ability of future generations to learn and connect with their heritage.

Alternative 2 – Current Management

Economic Condition

Public land grazing in the project area would continue to support 13 jobs and contribute $540,000 in labor income in the study area economy annually. Approximately 65 percent of the employment and 43 percent of the labor income would occur in the agricultural sector.

Alternative 2 does not include any range infrastructure improvements and therefore, would be less likely to improve livestock management effectiveness and efficiency, compared to Alternative 3. Additionally, non-monetary benefits associated with restoration activities under Alternative 3 (watershed, wildlife habitat, and vegetation improvement) would not take place.

Social Environment

Continuing current management would cause no environmental justice consequences. Alternative 2 would not disproportionately and adversely affect low-income or minority populations with continued supply of forage from project area allotments. Livestock grazing would continue to be an important use of National Forest System lands on all allotments, and ranchers' quality of life or social values related to sense of place would not be compromised.

Alternative 3 – Proposed Action

Economic Condition

Public land grazing in the project area would continue to support 13 jobs and contribute $540,000 in labor income in the study area economy annually. Approximately 65 percent of the employment and 43 percent of the labor income would occur in the agricultural sector.

Alternative 3 includes range infrastructure improvements that can add to the management effectiveness and efficiency of livestock operations. Additionally, non-monetary benefits associated with restoration activities would take place with implementation of prescribed grazing strategies to maintain or improve vegetative composition, vegetative structure, riparian conditions, and woody draw conditions. Under this alternative, adjustments to stocking rates or levels would be utilized only after implementation of other adaptive management tools has failed to meet objectives.

Social Environment

Social effects of Alternative 3 would the same as those described for Alternative 2.

Cumulative Effects

Ecological conditions (e.g., climate change) and market conditions (e.g., global beef production, changes in tastes and preferences for meat) may cause changes to the availability of and demand for forage. However, these changes are not reasonably foreseeable. No other actions in the study area (Slope and Bowman counties, North Dakota) are expected to affect socioeconomic conditions.

Agencies and Persons Consulted

The Forest Service consulted the following individuals and Federal, State, Tribal, and local agencies during the development of this environmental assessment:

Federal, State, and Local Agencies

U.S. Army Corps of Engineers

U.S. Forest Service

Bureau of Land Management

Theodore Roosevelt National Park

North Dakota Department of Health

North Dakota Game and Fish Department

North Dakota Geological Survey

North Dakota Industrial Commission

North Dakota Department of Trust Lands

North Dakota Parks and Recreation Department

North Dakota Tourism Promotion Department

Billings County Commission

Slope County Commission

Golden Valley County Highway Dept.

Tribes

Spirit Lake Tribe

Standing Rock Sioux Tribe

Three Affiliated Tribes

Three Affiliated Tribes

Turtle Mountain Band of Chippewa

Others

Dakota Resource Council

Dakota State Office

Ducks Unlimited

North Dakota Wildlife Federation

North Dakota Chapter, The Wildlife Society

Roosevelt-Custer Regional Council

Sierra Club-Dakota Chapter

Badlands Conservation Alliance

Dakota Cyclery

Society for Range Management, ND Chapter

American Rivers

Defenders of Wildlife

National Wildlife Federation

Prairie Hills Audubon Society

Western Watersheds Project

Western Lands Project

Medora Grazing Association

Little Missouri Grazing Association

Horse Creek Grazing Association

Hess Corporation

Whiting Oil and Gas Corporation

North Dakota Petroleum Council

Continental Resources, Inc.

Golden Valley News- Billings County Pioneer

Dickinson Press

The Prairie Blog

Lauren Donovan

Gary L. Mittlestadt

Keith Bartholomay

Allan Richard

Kip Kohlman

Lillian Crook

Jack Lefor

Jonathan Zieman

John A. Heiser

Gene Anderson

Steve Williams

Fred Price

Mark Sexton

Finding of No Significant Impact

As the responsible official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the CEQ Regulations (40 CFR 1508.13). I have reviewed and considered the environmental assessment and documentation included in the project record, and I have determined that the proposed action and alternatives will not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

Context

For the proposed action and alternatives, the context of the environmental effects is based on the environmental analysis in this environmental assessment. The proposed action and alternatives are limited in geographic application [40 CFR 1508.27(a)]. Activities associated with the alternatives are confined to the 17,693 acres of National Forest System lands in the Deep Creek Vegetation Management Project planning area described in the environmental assessment and are limited to those actions disclosed in the environmental assessment, its respective appendices, and the project record. Further, this action is consistent with Land and Resource Management Plan standards and guidelines and management area direction specified for the area. Effects are local in nature and are not likely to significantly affect regional or national resources (environmental assessment pages 2-4 and 9-42). Potential adverse impacts resulting from the project are minimized or avoided through implementation of project design features developed for this project (environmental assessment pages 6-7 and 9-42).

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this environmental assessment and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. My finding of no significant impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

1. **Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.**

   Both beneficial and adverse impacts associated with the project activities are presented in the environmental assessment (environmental assessment pages 9-42). The project will have little to no measurable effects when project design features and mitigation measures are implemented. Effects associated with project activities are within the range of effects identified in the Grasslands Plan. The finding of no significant environmental effects does not rely on beneficial effects to override adverse environmental effects.

   For some resources, implementing the selected alternative will exhibit both beneficial and adverse effects. The environmental assessment focuses more effort on those resource areas where there were some type of predicted adverse effect and provides sufficient

information to determine that this project will not have a significant impact (beneficial or adverse). One example of this is in the wildlife resource sections where you will see some adverse short-term effects from human disturbance and noise, along with long-term beneficial effects such as an increase in suitable nesting habitat (environmental assessment pages 29 through 34).

2. **The degree to which the proposed action affects public health or safety.**

   This project will comply with all State and Federal regulations. My review of the EA and the project record, including comments from the public, did not identify any concerns with the effects of the alternatives on public health and safety.

3. **Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.**

   The analysis documented in the environmental assessment discloses that, with the application of the project design features, project activities would not result in any significant effects to cultural or historic resources. Where heritage resources are identified, potential effects of the disturbance would be assessed and mitigation and avoidance measures would be employed. Where cultural heritage sites are identified, the State Historic Preservation Offices would be consulted in compliance with Section 106 of the National Historic Preservation Act (environmental assessment pages 39-40).

   Project design criteria would be applied to prevent or limit sediment introduction into streams and to protect riparian zones and wetlands. No long-term measurable negative effects to riparian areas or wetlands are expected (environmental assessment pages 3537).

   There are no other unique characteristics of significance in the geographic area.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.**

   The effects of this project are not considered to be controversial nor is there scientific dispute about these effects. This conclusion is based on the project record that shows a thorough review of relevant scientific information, a consideration of responsible opposing views, and the acknowledgment of incomplete or unavailable information, scientific uncertainty, and risk. The project file includes relevant literature citations, references to science, and monitoring results used in the project analysis to support this decision, as well as consideration of other scientific information as provided from other scientists, organizations, and agencies.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

   The planned actions are similar to numerous projects of this type that were analyzed, approved, and implemented on National Forest System lands. The analysis shows the effects are not uncertain, and do not involve unique or unknown risks. Therefore, based on the Forest Service’s experience with implementing these types of activities, as well as the requirement to implement project design to minimize effects, there would not be significant effects on the human environment.

6. **The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

   The planned management actions are similar to actions implemented without significant impacts in other areas on National Forest System, state, county, and private lands. None of the activities sets a precedent for future actions of significant effects. Management practices are consistent with management direction in the Grasslands Plan. These actions do not represent a decision in principle about future considerations.

7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.**

   The combined effects of past, present, and reasonably foreseeable future actions were considered and are summarized in each resources cumulative effects analysis (environmental assessment pages 9-42). Based on environmental analysis included in the environmental assessment, no cumulatively significant impact on the environment is anticipated.

8. **The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.**

   North Dakota State Historic Preservation Office was consulted under the National Historic Preservation Act Section 106 for this project. Archaeological site clearances and avoidance measures would be implemented as a part of and project related ground disturbance. Project activities are expected to have no adverse effect on historic properties (environmental assessment pages 39-40).

9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.**

   Threatened and endangered species were considered in the Wildlife Specialist Report/Biological Evaluation and summarized in the environmental assessment (pages 27-35). Project alternatives are expected to have no effect on threatened or endangered species that potentially occur on the Little Missouri National Grassland.

Table 16. Potential for effects to threatened and endangered species on the Little Missouri National Grassland

Species	Status*	Suitable habitat within analysis area	Observations within analysis area	Potential for effects
Black-footed Ferret (*Mustela nigripes*)	E	No	None	No
Gray Wolf (*Canis lupus*)	E	No	None	No
Interior Least Tern (*Sterna antillarum*)	E	No	None	No

Pallid Sturgeon (*Scaphirhynchus albus*)	E	No	None	No
Whooping Crane (*Grus americana*)	E	No	None	No
Dakota Skipper (*Hesperia dacotae*)	T	No	None	No
Northern Long-eared Bat (*Myotis septentrionalis*)	T	No	None	No
Piping Plover (*Charadrius melodus*)	T	No	None	No
Rufa Red Knot (*Calidris canutus rufa*)	T	No	None	No

*E = endangered, T = threatened

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

Project activities are consistent with the Grasslands Plan and applicable laws, regulations, and policies (see individual resource reports in the project record). The Grasslands Plan was developed in accordance with the National Forest Management Act (NFMA - 16 U.S.C.1604, et seq.) and the 1982 planning regulations. The project supports the National Forest Management Act, which gives the Forest Service statutory responsibility to provide the ecological conditions to both maintain the diversity of plant and animal communities and support the persistence of most native species in the plan area.

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Appendix A: Proposed Allotment-Specific Actions

Appendix A briefly describes the current condition of resources within the project area, and how data was collected to assess current conditions.

Appendix A then describes the proposed activities for each allotment. Permitted use, season of use, and grazing system used are displayed by allotment. The proposed action continues stocking at the current permitted use and continues use of the current grazing system unless specific actions are identified to meet resource needs.

The proposed management table for each allotment describes the current condition and/or a need for change. In most cases, for each need, we describe an initial action to address the need, and adaptive actions to be implemented if the initial action does not address the need. If conditions are still not progressing toward meeting objectives, tools from the adaptive management toolbox (Appendix C) could be applied, as appropriate. Project design features and monitoring measures are a part of the proposed action and apply to all allotments in the project area.

Existing Condition Information

Vegetation Composition

On December 3, 2013 a memorandum was issued to serve as the official notice to shift from Dakota Prairie Grasslands Plan direction with objectives for seral stage percentages across the landscape by geographic area (USDA Forest Service 2001) to use of state-and-transition models described in ecological site descriptions for vegetative composition objectives across the Dakota Prairie Grasslands.

During the summers of 2011and 2012, North Dakota State University collected baseline vegetative data in cooperation with the Little Missouri Grazing Association and the Forest Service. Each study plot was evaluated to determine which plant community phase (as illustrated in the state-and-transition diagram in the ecological site description) was present on that particular ecological site. The baseline data collected by North Dakota State University was used to determine the existing condition. The ecological site state-and-transition diagrams were used to determine how the rangeland vegetation is expected to respond to the proposed management. The ecological site descriptions are available in the project record and online at https://efotg.sc.egov.usda.gov/#/.

Similarity index for each plot was calculated. Similarity index is the present state of vegetation of an ecological site in relation to the potential reference plant community for the site based on kind, proportion, and amounts of plants present; it suggests current productivity and diversity relative to reference potential. The evaluation of the similarity index provides a baseline of information (existing condition). Changes in plant community composition can be monitored over time to determine whether condition are moving toward or meeting management goals.

Desired conditions and management goals for the Deep Creek Vegetation Management Project are based on the state-and-transition diagrams in the ecological site descriptions. Allotmentspecific management changes have been proposed to improve vegetation composition at the allotment level. Management activities should ensure that plant community phases remain in their current state or improve along the restoration pathway and not decline along a transition pathway.

Areas that are dominated by greater than 70 percent crested wheatgrass will be managed as crested wheatgrass units unless allotment-specific restoration activities are identified. A complete analysis will be included in the Range Specialist Report and incorporated into project analysis. This analysis may include review at the project level, pasture level, allotment level, or the individual grazing unit level.

Vegetative Structure

Visual obstruction readings were taken in the fall of 2005, 2006, 2008, 2009, 2010, 2012, 2015 and 2017. Initial visual obstruction readings were collected based on biologically capable habitat types. The existing visual obstruction reading data has been re-evaluated based on biologically capable ecological sites. The data in the tables below is displayed using both methods, first by habitat types and then by ecological sites.

A 3-year study was completed by North Dakota State University in 2014 (Klempel 2015) and the results are summarized as recommendations regarding which ecological site descriptions are capable of producing high structure, as well as recommendations for which areas to monitor based on the amount of precipitation that falls within a given year. Future project area monitoring will be based on North Dakota State University's recommendations for monitoring visual obstruction readings on biologically capable ecological sites.

Woody Draws

The Forest Service staff sampled 23 woody draws throughout the Deep Creek Vegetation Management Project area during the growing season of 2016. Five allotments within this project area contained green ash wood lands with 57 plots sampled using the Protocol for Determining Community Phases of Wooded Draws on the Little Missouri National Grassland Using Ecological Site Descriptions (Butler 2016). Ocular observations were made on 12 of the 23 woody draws since the existing soils, percent slope, and herbaceous/shrub/tree community within these woody draws were representative of either an ecological site in an invaded state or an invaded wooded state. Three provisional woody draw ecological site descriptions and their state and transition models were used to describe the existing condition of the woody draws sampled (USDA NRCS 2016a-c).

As the project area has not received intensive or experimental study, determining the causal factors responsible for their current condition is not possible. However, it is assumed that there may be many factors, working alone or in combination, that contribute to the structure and composition of woody draws observed in 2016.

Future monitoring will utilize ecological site descriptions currently being developed by Natural Resources Conservation Service for wooded draws in western North Dakota.

Riparian Resources

Riparian conditions along intermittent and perennial streams in the project area were evaluated in 2012 using proper functioning condition protocol (Prichard 2003), with the exception of allotments 044, 056, 87, and 95. The four allotments that were not assessed in 2012 were assessed in 2016. Proper functioning condition is a method for determining the condition of riparian areas and the factors that may be affecting riparian health. It rates a stream or stream reach based on vegetation cover, bank erosion, soil moisture, stream channel sinuosity. The ratings are as follows:

- **Proper functioning conditioning:** Stream is in balance with the landscape, no excessive erosion/deposition, vegetative cover indicates high soil moisture (wetland) conditions and has high vigor, channel is very sinuous, little or no bank erosion.
- **Functional at risk – upward trend:** May indicate past problems that healing through better vegetative cover, decreased erosion, better sinuosity, and better soil moisture retention
- **Functional at risk – trend not apparent**: Some deposition/erosion occurring, moderate vegetative vigor, some streambank drying, but elements are still in place for recovery without large inputs; trend could go either way depending on disturbances.
- **Functional at risk – downward trend:** Plant communities dominated by more mesic species rather than wetland species, Erosion happening at large rates, Channel starts to straighten with increased velocity from lack of streambank cover and floodplain storage is severely decreased.

Allotment Specific Proposals

Allotment 008

Current Management:

x Federal Permitted Use: 509

AUMs x Federal Permitted AU:

132 head x Season of use: 5/1 to

10/3

x The allotment is made up of 4 pastures, alternating first pasture each year in a twice through rotation. Cattle are run as one herd.

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 7 Vegetation Plots: x Similarity Index: 3 plots (0-25%); 2 plots (2650%); 1 plot (51-75%); 1 plot (76-100%) x Evidence of increased invasive grasses into native x Crested wheatgrass stand in the southern portion of Section 28, T133N, R103W x Utilize introduced species x Reduce excess litter	Install cross fences in Section 28 to split the section into three pastures	Adjust season of use
Vegetative Structure By biologically capable habitat type (total of 23 transects between 2005 to 2015): x 3 low, 16 moderate, 4 high structure By biologically capable ESDs (total of 25 transects in years 2005, 2006, 2008, 2009, 2012, 2015): x Transects average: 19% low, 72.6% moderate, 8.3% high structure x Stations average: 34.3% low, 62.7% moderate, 2.9% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable
Need	**Initial Action**	**Adaptive Action**

Riparian Condition West Fork of Deep Creek (2012) x Reach 1: 0.96 miles PFC x Reach 2: 0.58 miles overall PFC with some sections FAR and NF as a result of heavy browsing and trailing by livestock.	Maintain PFC Install a pipeline and stock tank in Section 28, T133N, R103W from existing well in Section 28 Plug abandoned well in the SW ¼ of Section 20, T133N, R103W	Develop artesian well in the SE ¼ of Section 28, T133N, R103W including a storage tank and gravity fed pipeline to a stock tank
Other	Remove metal debris from the SW ¼ of Section 20, T133N, R103W	

Allotment 012

Current Management:

x Federal Permitted Use: 716

AUMs x Federal Permitted AU:

259 head x Season of use: 5/20 to

10/20

x The allotment is made up of 6 pastures and 2 grazing permits, alternating first pasture each year in a twice through rotation. Cattle are run as 2 herds. The grazing association member in the west pastures generally turns in mid-May through mid-August and rotates twice through 4 pastures beginning in a different pasture each year. The grazing association member in the east pastures generally turns in mid-June and rotates in 2 pastures until midOctober.

Proposed Management:

Need	Initial Action	Adaptive Action

Vegetation Composition 5 Vegetation Plots: x Similarity Index: 3 plots (0-25%); 2 plots (26-50%) x Annual/pioneer perennial species; x Invaded state x Utilize crested wheatgrass.	Split allotment into two separate allotments: Allotment 12W will include Sections 4 and 9, T133N, R102W Allotment 12E will include Sections 35 and 36, T134N, R102W and Section 31, T134, R101W New Allotment 12W: x Fertilize crested wheatgrass in pastures 003 and 007 x Install cross fence in pasture 007 to split into 2 pastures New Allotment 12E: x Install cross fencing in pasture 2, on the E boundary of Section 36, T134N, R102W, to split into two pastures	

Need	Initial Action	Adaptive Action
Vegetative Structure By biologically capable habitat type (total of 25 transects between 2005 to 2015): x 8 low, 14 moderate, 3 high structure By biologically capable ESDs (total of 38 transects in years 2005, 2006, 2010, 2012, 2015): x Transects average: 25% low, 62.5% moderate, 12.5% high structure x Stations average: 34.7% low, 62.0% moderate, 3.3% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable.
Riparian Condition East Fork of Deep Creek (2012) x Reach 2: 2.2 miles PFC	x tment 12W: Remove livestock drift fence in the NE ¼ of Section 9, T133N, R102W x Construct a hardened stream water crossing(s) in Section 4, T133N, R102W and Section 9, T133N, R102W	If monitoring shows decline in Woody Draw and/or PFC. Consider utilizing a Cross Fence in SE Sec 9. x Add stock tank in SW 5.

	x Install pipeline and stock tank in the NW ¼ of Section 9, T133N, R102W and another pipeline and stock tank in the SW ¼ of Section 4, T133N, R102W from existing stock tank on private in SW ¼ of Section 9, T133N, R102W x Remove dam in W ½ of Section 9, T133N, R102W New Allotment 12E: x Drill a well in Section 31, T134N, R101W or pipe in water to this section from Southwest Water Authority to two new stock tanks located in NW ¼ of Section 31, T134N, R101W and in the NE ¼ of Section 36, T134N, R102W on State land	

Allotment 013

Current Management:

x Federal Permitted Use: 385

AUMs x Federal Permitted AU:

77 head x Season of use: 5/15 to

10/15

x The allotment is made up of 2 pastures, though gates are open to allow cattle to move freely between the two since 2001 due to lack of livestock water in northern pasture. Cattle are run as one herd. Cattle are turned in mid-May and removed mid-October.

Proposed Management:

Need	Initial Action	Adaptive Action

Vegetation Composition 6 Vegetation Plots: x Similarity Index: 3 plots (0-25%) 2 plots (26-50%) x 1 plot (51-75%) Annual /pioneer perennial species on loamy ecological sites x Native and native invaded states on very shallow ecological sites Utilize crested wheatgrass and Kentucky bluegrass, decrease litter biomass, increase forage utilization.	Install pipeline and two stock tanks to provide water in W ½ of Section 10, T134N, R103W in pasture 1 and E ½ of Section 15, T134N, R103W in pasture 2 Adjust season of use in a twopasture deferred rotation grazing system	Install cross fencing in W ½ Section 10, T134N, R103W or N ½ of Section 15, T134N, R103W and an additional stock tank
Vegetative Structure By biologically capable habitat type (total of 31 transects between 2005 to 2015): x 6 low, 24 moderate, 1 high structure By biologically capable ESDs (total of 31 transects in years 2005, 2006, 2008, 2009, 2012, 2015): x Transects average: 18.8% low, 75.7% moderate, 5.6% high structure x Stations average: 31.8% low, 66.6% moderate, 1.6% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable.

Allotment 018

Current Management:

x Federal Permitted Use: 276 AUMs

x Federal Permitted AU: 72

head x Season of use: 5/1 to

8/31

x The allotment is made up of 2 pastures. Cattle graze in a twice or 3 times through rotation with about 30 day rest. The grazing period is generally early May to late August.

Proposed Management:

Need	Initial Action	Adaptive Action

Vegetation Composition 6 Vegetation Plots: x Similarity Index: 4 plots (0-25%) 2 plots (26-50%) Native/invaded and invaded states on shallow sandy, sandy and sands ecological sites Utilize crested wheatgrass and Kentucky bluegrass, decrease litter biomass	Modify the current grazing rotation system to rotate through the pastures only twice while still providing at least 30 days of rest between the first and second pasture rotation	Install cross fencing in Section 19, T134N, R104W Install pipeline and two stock tanks
Vegetative Structure By biologically capable habitat type (total of 10 transects between 2005 to 2012): x 3 low, 7 moderate, 0 high structure By biologically capable ESDs (total of 10 transects in years 2005, 2006, 2008, 2009, 2012): x Transects average: 30.0% low, 70.0% moderate, 0% high structure x Stations average: 42.0% low, 58.0% moderate, 0% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable.

Allotment 022

Current Management:

x Federal Permitted Use: 192

AUMs x Federal Permitted AU:

64 head x Season of use: 6/1 to

10/1

x The allotment is made up of 2 pastures; however, they are grazed together due to lack of water in the SE ¼ of Section 30. Cattle graze in a once through rotation. The grazing period rotates; June through September or July through October.

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 5 Vegetation Plots: x Similarity Index: 1 plot (0-25%) 4 plots (26-50%) x Native/invaded and invaded states Increase similarity index post prairie dog management Utilize Kentucky bluegrass, reduce excess litter.	Drill well in SE ¼ of Section 30, T133N, R103W which will be solar powered Install pipeline and stock tanks on the SE ¼ of Section 30, T133N, R103W; the W ½ of Section 31; T133N, R103W; and on State land in Section 36, T133N, R104W Install cross fencing in the W ½ of Section 31, T133N, R103W to split pasture 1 into two pastures Adjust season of use with a deferred rotation grazing system	Manage salt and supplement locations Disk or drag prairie dog mounds after control efforts
Vegetative Structure By biologically capable habitat type (total of 2 transects in 2006): x 1 low, 1 moderate, 0 high structure By biologically capable ESDs (total of 3 transects in years 2005, 2006): x Transects average: average 25% low, 75.0% moderate, 0% high structure x Stations average: 63.8% low, 36.3% moderate, 0% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable

Allotment 023

Current Management:

x Federal Permitted Use: 160

AUMs x Federal Permitted AU:

75 head x Season of use: 5/2 to

7/1

x The allotment is made up of 3 pastures. Cattle graze in a once through rotation with a second time through in alternating pastures. The grazing period is early May through early July to utilize crested wheatgrass.

Need	Initial Action	Adaptive Action

Proposed Management:

Vegetation Composition 1 Vegetation Plot: x Similarity Index: 1 plot (0-25%) x Annual/Pioneer perennial/Native/invaded and invaded states [This single plot likely does not represent vegetation composition in this allotment. Plot occurred on broken lands within one of three pastures. Native plant communities exist within the remaining pastures.] Utilize crested wheatgrass and other introduced species	Modify the current grazing rotation system to rotate through the pastures only twice while still providing at least 30 days of rest between the first and second pasture rotation	Adjust animal unit months (increase stocking rate)
Vegetative Structure By biologically capable habitat type (total of 5 transects between 2005 and 2015): x 3 low, 2 moderate, 0 high structure By biologically capable ESDs (total of 6 transects in years 2005, 2006, 2010, 2012, 2015): x Transects average: 40.0% low, 50.0% moderate, 10.0% high structure x Stations average: 38.0% low, 59.0% moderate, 3.0% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Riparian Condition	Remove dugout in NE ¼ of Section 12, T133N, R104W	

Allotment 044

Current Management:

x Federal Permitted Use : 456

AUMs x Federal Permitted AU:

169 head x Season of use: 6/1 to

10/30

x The allotment is made up of 2 pastures. There are 4 grazing permits issued to this allotment annually. Three of the 4 herds run together and are turned in early June, alternating in to Pasture 1 then Pasture 2. These herds are taken out late September. The fourth herd is turned in with the other 3 herds early August and remains until the end of October.

Need	Initial Action	Adaptive Action

Proposed Management:

Vegetation Composition 9 Vegetation Plots: x Similarity Index: 6 plots (26-50%) 3 plots (51-75%) x Native/invaded states	Continue current management and monitor	
Vegetative Structure By biologically capable habitat type (total of 25 transects between 2005 and 2015): x 0 low, 24 moderate, 1 high structure By biologically capable ESDs (total of 25 transects in years 2005, 2006, 2010, 2015): x Transects average: 0% low, 96.4% moderate, 3.6% high structure x Stations average: 13.8% low, 82.2% moderate, 4.0% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Woody Draws Flat Bottom: x 2.3-1 plot x 3.1-5 plots Loamy Overflow: x 3.1-1 plot x 4.2-1 plot Steep sided: x 2.1-2 plots **Riparian Condition** Reach 9: 2.85 miles PFC Reach 10: 0.35 miles PFC	Maintain PFC Construct a hardened crossing at 2 track trail across Deep Creek for vehicles in N half of Section 20, T134N, R102W Construct a hardened crossing at 2 track trail across Deep Creek for vehicles in SE ¼ of Section 20, T134N, R102W Install pipeline from well in NW ¼ of Section 19, T134N, R102W to a water storage tank in Section 19, T134N, R102W, then install a pipeline and stock tank in the W ½ of Section 20, T134N, R102W and another pipeline and stock tank in the E ½ of Section 20, T134N, R102W	Construct hardened crossings where needed for livestock to cross Deep Creek in Sections 20 and 21, T134N, R102W

Allotment 056

Current Management:

x Federal Permitted Use: 64

AUMs x Federal Permitted AU:

43 head x Season of use: 6/5 to

7/20

x The allotment consists of one pasture. Cattle are turned in early June and taken out mid to late July in a once through rotation.

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 2 Vegetation Plots: x Similarity Index: 1 plot (26-50%) 1 plot (51-75%) x Native/Invaded states Reduce excess litter	Maintain existing well and stock tank to re-establish functionality	Adjust season of use
Vegetative Structure By biologically capable habitat type (total of 3 transects between 2005 and 2015): x 0 low, 2 moderate, 1 high structure By biologically capable ESDs (total of 3 transects in years 2005, 2006, 2015): x Transects average: 0.0% low, 66.7% moderate, 33.3% high structure x Stations average: 7.8% low, 73.9% moderate, 18.3% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Woody Draws Flat Bottom: x 3.1-1 plot Steep sided: x 2.1-1 plot	Fix road/trail where erosion is occurring nearby the woody draw in the SE ¼ SE ¼ of Section 32, T135N, R102W	
Riparian Condition Reach 6: 0.8 miles PFC	Maintain PFC Construct hardened stream crossing in the SE ¼ of Section 32, T135N, R102W	Improve well to create dependable off-stream water

Allotment 058

Current Management:

x Federal Permitted Use: 62 AUMs x Federal Permitted AU: 63 head x Season of use: 6/7 to 8/7

x The allotment is made up of 2 pastures. Cattle are turned in early June and taken out early July to mid-August in a once through rotation.

Need	Initial Action	Adaptive Action

Proposed Management:

Vegetation Composition 2 Vegetation Plots: x Similarity Index: 1 plot (0-25%) 1 plot (26-50%) x Annual/pioneer perennial species and in an invaded state Utilize crested wheatgrass and excess litter.	Install pipeline and stock water tank in NW ¼ of Section 26, T135N, R103W Adjust season of use following a two-pasture deferred rotation	Fertilize crested wheatgrass Install cross fencing Install pipeline to SE ¼ of Section 27, T135N, R103W
Vegetative Structure By biologically capable habitat type (total of 1 transect in 2006): x 0 low, 1 moderate, 0 high structure By biologically capable ESDs (total of 2 transects in years 2005, 2006): x Transects average: 50.0% low, 50.0% moderate, 0.0% high structure x Stations average: 52.5% low, 47.5% moderate, 0.0% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Other	Allow braided roads to heal naturally in the SW ¼ NW ¼ of Section 26, T135N, R103W Remove old barbed wire rolls in pasture 1	Repair braided road in the SW ¼ NW ¼ of Section 26, T135N, R103W

Allotment 084

Current Management:

x Federal Permitted Use: 288

AUMs x Federal Permitted AU:

72 head x Season of use: 5/1 to

8/18

x The allotment is made up of 5 pastures. Cattle are turned in to Pastures 1, 2, and 3 early May to utilize crested wheatgrass then removed from federal land mid-June. Cattle are turned into Pastures 4N and 4S in August for about 2 weeks to graze the primarily native vegetation.

Allotment 085

Current Management:

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 4 Vegetation Plots: x Similarity Index: 2 plots (0-25%) 1 plot (26-50%) 1 plot (51-75%) x Annual/pioneer perennial species on loamy ecological sites and in native state on very shallow ecological sites Utilize crested wheatgrass and excess litter	Continue current management and monitor	Install pipeline and stock tank in the S ½ of Section 9, T134N, R103W Install cross fencing in the S ½ of Section 9, T134N, R103W
Vegetative Structure By biologically capable habitat type (total of 12 transects between 2005 and 2015): x 1 low, 8 moderate, 3 high structure By biologically capable ESDs (total of 12 transects in years 2005, 2006, 2010, 2012, 2015): x Transects average: 6.7% low, 56.7% moderate, 36.7% high structure x Stations average: 18.0% low, 73.7% moderate, 8.3% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable

x Federal Permitted Use: 275 AUMs x Federal Permitted AU: 80 head x Season of use: 5/15 to 8/5

x The allotment is made up of 3 pastures. Cattle are turned in mid-May and removed midAugust spending about 30 days in each pasture.

Need	Initial Action	Adaptive Action
Vegetation Composition 5 Vegetation Plots: x Similarity Index: 4 plots (0-25%) 1 plot (26-50%) x Annual/pioneer perennial species and native/invaded States Utilize Kentucky bluegrass and crested wheatgrass, reduce excess litter	Manage placement of mineral supplements Adjust season of use with a 3pasture deferred rotation grazing system	Monitor adjusted season of use Adjust animal unit months (increase stocking rate)

Proposed Management:

Vegetative Structure By biologically capable habitat type (total of 20 transects between 2005 and 2015): x 6 low, 12 moderate, 2 high structure By biologically capable ESDs (total of 21 transects in years 2005, 2006, 2008, 2009, 2012, 2015, 2017): x Transects average: 26.2% low, 59.5% moderate, 14.3% high structure x Stations average: 44.3% low, 51.7% moderate, 4.0% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Riparian Condition PFC (2012) Concerns with livestock trailing, pedestalling, and bare ground due to livestock trampling in areas along the West Fork of Deep Creek in the SW ¼ of Section 22, T133N, R103W	Maintain PFC Install pipeline from existing well in the SE ¼ of Section 21, T133N, R103W to a stock tank in the SW ¼ of Section 22, T133N, R103W Install a pipeline from the existing stock tank in the NE ¼ of Section 21, T133N, R103W to a stock tank in the NW ¼ of Section 21, T133N, R103W Remove dam in the NW ¼ of Section 21, T133N, R103W	

Allotment 087

Current Management:

x Federal Permitted Use: 878

AUMs x Federal Permitted AU:

176 head x Season of use: 5/14 to

12/10

x The allotment is made up of 3 pastures. Cattle are turned in mid-May, and removed in midDecember utilizing a twice-over grazing system.

Need	Initial Action	Adaptive Action

Proposed Management:

Vegetation Composition 9 Vegetation Plots: x Similarity Index: 5 plots (26-50%) 4 plots (51-75%) x Native/invaded states Utilize excess litter	Install a pipeline from private well across the N ½ of Section 18, T134N, R102W with a stock tank in the NE ¼ of Section 18, T134N, R102W	
Vegetative Structure By biologically capable habitat type (total of 20 transects between 2005 and 2015): x 3 low, 15 moderate, 2 high structure By biologically capable ESDs (total of 20 transects in years 2005, 2006, 2015): x Transects average: 15.1% low, 75.4% moderate, 9.5% high structure x Stations average: 27.4% low, 69.9% moderate, 2.7% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable
Woody Draws Flat Bottom: x 2.3-1 plot x 3.1-4 plots x 2.3 & 4.2-1 plot Flat Bottom & Loamy Overflow: x 2.3 & 4.2-2 plots Loamy Overflow: x 3.1-2 plots x 4.2-7 plots Steep Sided: x 1.2-1 plot x 2.1-5 plots	Install a pipeline from the waterlot in the NW ¼ of Section 6, T134N, R102W with a stock tank in the W ½ of Section 5 or in the E middle w̄ of Section 6, T134N, R102W	
Riparian Condition Reach 6: 1.1 miles PFC Reach 7: 1.8 miles PFC Reach 8: 2.2 miles PFC	Maintain PFC Construct a hardened crossing or install a culvert for vehicles on the 2 track trail across moist soils in the SW ¼ of Section 5, T134N, R102W Construct a hardened creek crossing in the SW ¼ of Section 17, T134N, R102W	

Proposed Management:

Allotment 090

Current Management:

x Federal Permitted Use: 300 AUMs

x Federal Permitted AU: 200

head x Season of use: 6/16 to

10/16

x The allotment consists of one pasture. Cattle are turned in mid-June and taken out midOctober. Cattle are seldom in allotment all 4 months due to lack of reliable water for livestock

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 5 Vegetation Plots: x Similarity Index: 3 plots (0-25%) 2 plots (26-50%) x Annual/pioneer perennial species, Native/invaded states Utilize Kentucky bluegrass and crested wheatgrass. Remove excess litter biomass.	Drill well in the SW ¼ of Section 33, T133N, R103W Install a pipeline with a stock tank in the middle of Section 33 and in the SE ¼ of Section 33, T133N, R103W Install cross fencing in Section 33, T133N, R103W to create two pastures Adjust season of use by implementing a two-pasture deferred rotation	Hay areas of decadent crested wheatgrass Pipe water from private land in the south to a stock tank near the center and in the SE ¼ of Section 33, T133N, R103W
Vegetative Structure By biologically capable habitat type (total of 26 transects between 2005 and 2012): x 2 low, 16 moderate, 8 high structure By biologically capable ESDs (total of 25 transects in years 2005, 2006, 2008, 2009, 2012, 2015): x Transects average: 8.3% low, 58.3% moderate, 33.3% high structure x Stations average: 18.2% low, 67.7% moderate, 14.1% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Riparian Condition	Remove dam in SW ¼ of Section 34, T133N, R103W	

Allotment 094

Current Management:

x Federal Permitted Use: 267

AUMs x Federal Permitted AU:

350 head x Season of use: 5/15 to

12/30

Proposed Management:

- The allotment consists of one pasture. Cattle are turned in mid-May and taken out the middle of June to utilize crested wheatgrass. Seventy to 85 cows are turned in midSeptember or Mid-October and taken out in December.

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 5 Veg Plots: x Similarity Index: 2 plots (0-25%) 3 plots (26-50%) x Annual/pioneer perennial species, Native/invaded states, invaded state Utilize crested wheatgrass.	Install cross fencing on the boundary between Sections 5 and 8, T133N, R102W and in the middle of Section 5, T133N, R102W to create three pastures Implement a 3-pasture deferred rotation grazing system	Adjust season of use
Vegetative Structure By biologically capable habitat type (total of 23 transects between 2005 and 2015): x 4 low, 17 moderate, 2 high structure By biologically capable ESDs (total of 23 transects in years 2005, 2006, 2008, 2009, 2012, 2015): x Transects average: 22.2% low, 66.7% moderate, 11.1% high structure x Stations average: 31.0% low, 65.8% moderate, 3.2% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Riparian Condition West Fork of Deep Creek (2012) at PFC though segments exhibited grazing impacts	Maintain PFC Install a pipeline from the private stock tank in the SW ¼ of Section 8, T133N, R102W with a stock tank in the SW ¼ of Section 5, T133N, R102W and a stock tank in the NW ¼ of Section 5, T133N, R102W	

Allotment 095

Current Management:

x Federal Permitted Use: 1,014 AUMs x Federal Permitted AU: 214 head x Season of use: 4/5 to 12/30

- Five pastures that include federal land are in this allotment. Cattle are generally run as 2 herds; 80 cow/calf pairs and 100 yearlings. Cows are turned in to pastures 7 and 8 for calving early April then moved to pasture 10 through the end of February. Yearlings are turned in to pasture 9 in June and rotated through Federal, leased, and private land pastures approximately every 30 days. Generally, 225 cow/calf pairs are turned in to Pasture 12 the middle of August until the end of December.

Need	Initial Action	Adaptive Action
Vegetation Composition 6 Vegetation Plots: - Similarity Index: 3 plots (26-50%) 3 plots (51-75%) - Native/invaded states, and invaded state Utilize cool season forage and reduce excess litter.	Install cross fencing in Section 29, T134N, R102W to create two pastures	Adjust season of use in the SW ¼ of Section 30, T134N, R102W to allow for regrowth opportunities.
Vegetative Structure By biologically capable habitat type (total of 22 transects between 2005 and 2015): - 2 low, 19 moderate, 1 high structure By biologically capable ESDs (total of 22 transects in years 2005, 2006, 2015, 2017): - Transects average: 28.1% low, 66.9% moderate, 5.0% high structure - Stations average: 34.8% low, 63.3% moderate, 1.9% high structure	Manage for Grasslands Plan desired structure objectives	If not meeting objectives, implement Grazing Management Toolbox as applicable
Woody Draws Flat Bottom - 3.1-4 plots Loamy Overflow - 3.1-4 plots - 4.2-6 plots Steep sided - 2.1-1 plot		

Proposed Management:

Riparian Condition At PFC	Maintain PFC Install a pipeline in pasture 12 from the SE ¼ of Section 30, T134N, R102W with a stock tank in Section 29, T134N, R102W	
Other	Remove garbage and fencing debris in the NE ¼ of the SW ¼ of Section 30, T135N, R102W Modify existing corral in the SW ¼ of Section 30, T135N, R102W	

Allotment 096

Current Management:

x Federal Permitted Use: 160

AUMs x Federal Permitted AU: 27

head

x Season of use: 5/5 to 8/5

x The allotment is made up of 2 pastures. Cattle are generally turned out the beginning of May and removed around the middle of August in a twice-over rotation.

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 3 Vegetation Plots: x Similarity Index: 1 plot (0-25%) 2 plots (51-75%) x Native/invaded states, Annual/pioneer perennial species Utilize crested wheatgrass and Kentucky bluegrass, reduce litter biomass.	Install a stock tank in the NE ¼ of Section 11, T133N, R104W	Install cross fencing Implement prescribed burning to reduce litter

Vegetative Structure By biologically capable habitat type (total of 6 transects between 2005 and 2015): x 1 low, 4 moderate, 1 high structure By biologically capable ESDs (total of 5 transects in years 2005, 2006, 2012, 2015): x Transects average: 0.0% low, 75.0% moderate, 25.0% high structure x Stations average: 36.9% low, 58.1% moderate, 5.0% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable

Allotment 108

Current Management:

x Federal Permitted Use: 1170

AUMs x Federal Permitted AU:

207 head x Season of use: 5/6 to

10/15

x The allotment is made up of 4 pastures. There are 3 grazing permits issued to this allotment annually. Two herds are generally turned in to the same pasture within a week of each other, early to mid-May, annually rotating the first pasture turned in. The third herd generally turns into a different pasture and cattle remain there until mid-July when they are combined into the rotation with the other two herds. Cattle are generally taken out early to mid- October.

Need	Initial Action	Adaptive Action

Proposed Management:

Vegetation Composition 6 Vegetation Plots: x Similarity Index: 3 plots (0-25%) 3 plots (26-50%) x Invaded states, Annual/pioneer perennial species Utilize crested wheatgrass, Kentucky bluegrass, and Canada bluegrass.	Install a storage tank at the well site in the NW ¼ of Section 30, T134N, R103W Move the stock tank at the well site in pasture 1 to the SW ¼ of Section 19, T134N, R103W with a pipeline Add a pipeline from the existing tank in pasture 2 to a second stock tank in the SE of Section 25, T134N, R104W Adjust fence in the NE corner of pasture 2 further to the south approximately one eighth of a mile Rebuild and clean out reservoir in the SW ¼ of Section 30, T134N, R103W Adjust season of use by implementing a deferred rotation system with one herd Repair braided road in pasture 1 Redesign corrals in pasture 1 on the west side	
Vegetative Structure By biologically capable habitat type (total of 46 transects between 2005 and 2015): x 14 low, 27 moderate, 5 high structure By biologically capable ESDs (total of 48 transects in years 2005, 2006, 2008, 2012, 2015, 2017): x Transects average: 23.3% low, 62.8% moderate, 13.9% high structure x Stations average: 35.8 % low, 60.6% moderate, 3.6% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable

Allotment 109

Current Management:

x Federal Permitted Use: 153 AUMs x Federal Permitted AU: 30 head x Season of use: 5/1 to 9/30

- The allotment consists of one pasture. Cattle are turned in early May and taken out late September.

Proposed Management:

Need	Initial Action	Adaptive Action
Vegetation Composition 3 Vegetation Plots: x Similarity Index: 1 plot (0-25%) 2 plot (51-75%) x Native/Invaded and Invaded states Utilize crested wheatgrass and reduce litter biomass.	Install a storage tank at the well site in the SE ¼ of Section 10, T134N, R103W Install a pipeline with a stock tank in the SW ¼ of Section 11, T134N, R103W Continue season-long grazing system	Adjust season of use Rehabilitate spring in the SW ¼ of Section 11, T134N R103W Install cross fencing
Vegetative Structure By biologically capable habitat type (total of 8 transects between 2005 and 2015): x 2 low, 4 moderate, 2 high structure By biologically capable ESDs (total of 8 transects in years 2005, 2006, 2012, 2015): x Transects average: 25.0% low, 50.0% moderate, 25.0% high structure x Stations average: 24.4% low, 71.9% moderate, 3.8% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable

Allotment 110

Current Management:

x Federal Permitted Use: 690

AUMs x Federal Permitted AU:

138 head x Season of use: 5/15 to

10/15

x The allotment is made up of 5 pastures. There are 3 grazing permits issued to this allotment annually. Cattle are turned in to 3 separate pastures mid-May to early June to utilize crested wheatgrass. Cattle are then rotated as one herd through each pasture until the end of August, rotating months of use annually. All cattle have access to all pastures September and October, then removed.

Need	Initial Action	Adaptive Action

Proposed Management:

Vegetation Composition 6 Vegetation Plots: x Similarity Index: 2 plots (0-25%) 1 plot (26-50%) 3 plots (51-75%) x Annual/pioneer perennial species x Native/Invaded states Utilize crested wheatgrass and reduce litter biomass	Continue early season grazing with three herds Combine into one herd with a deferred rotation grazing system Inter-seed two areas of pasture 2 with native grass species in the S ½ of Section 29, T133N, R102W	Manage cattle as one herd to relieve grazing pressure during crucial plant growth periods Adjust season of use Install cross fencing
Vegetative Structure By biologically capable habitat type (total of 38 transects between 2005 and 2015): x 8 low, 24 moderate, 6 high structure By biologically capable ESDs (total of 33 transects in years 2005, 2006, 2008, 2010, 2012, 2015): x Transects average: 30.0% low, 51.7% moderate, 18.3% high structure x Stations average: 38.0% low, 55.3% moderate, 6.8% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Riparian Condition East Fork of Deep Creek (2012) - Reach 1 (pasture 4): PFC Reach 2 (pastures 2 & 5): FAR-NF due to being heavily trailed and high grazing pressure	Develop well and install a storage tank in the SE ¼ of Section 30, T133N, R102W Install a pipeline to new stock tank in the NW ¼ of Section 31, T133N, R102W Remove stock tank in the SW ¼ Section 31, T133N, R102W Continue to monitor Deep Creek in pasture 2 due to newly installed stock tanks implemented in 2016	

Allotment 120

Current Management:

x Federal Permitted Use: 64 AUMs x Federal Permitted AU: 40 head x Season of use: 8/10 to 9/30

Proposed Management:

- This allotment consists of one pasture. Cattle are grazed in a once through rotation alternating use in either early or late summer.

Need	Initial Action	Adaptive Action
Vegetation Composition 3 Vegetation Plots: - Similarity Index: 2 plots (0-25%) 1 plot (26-50%) - Annual/pioneer perennial species - Native/Invaded states Utilize crested wheatgrass and reduce litter biomass.	Continue current management and monitor	Adjust season of use
Vegetative Structure By biologically capable habitat type (total of 4 transects between 2005 and 2015): - 1 low, 2 moderate, 1 high structure By biologically capable ESDs (total of 5 transects in years 2005, 2006, 2008, 2012, 2015): - Transects average: 40.0% low, 40.0% moderate, 20.0% high structure - Stations average: 40.0% low, 59.0% moderate, 1.0% high structure	Manage for Grasslands Plan desired structure objectives.	If not meeting objectives, implement Grazing Management Toolbox as applicable
Woody Draws Loamy Overflow x 4.2-2 plots Steep Sided x 1.2-2 plots x 2.1-1 plot		
Other		Land exchange or sale of National Forest System land

Appendix B: Adaptive Management Decision Process

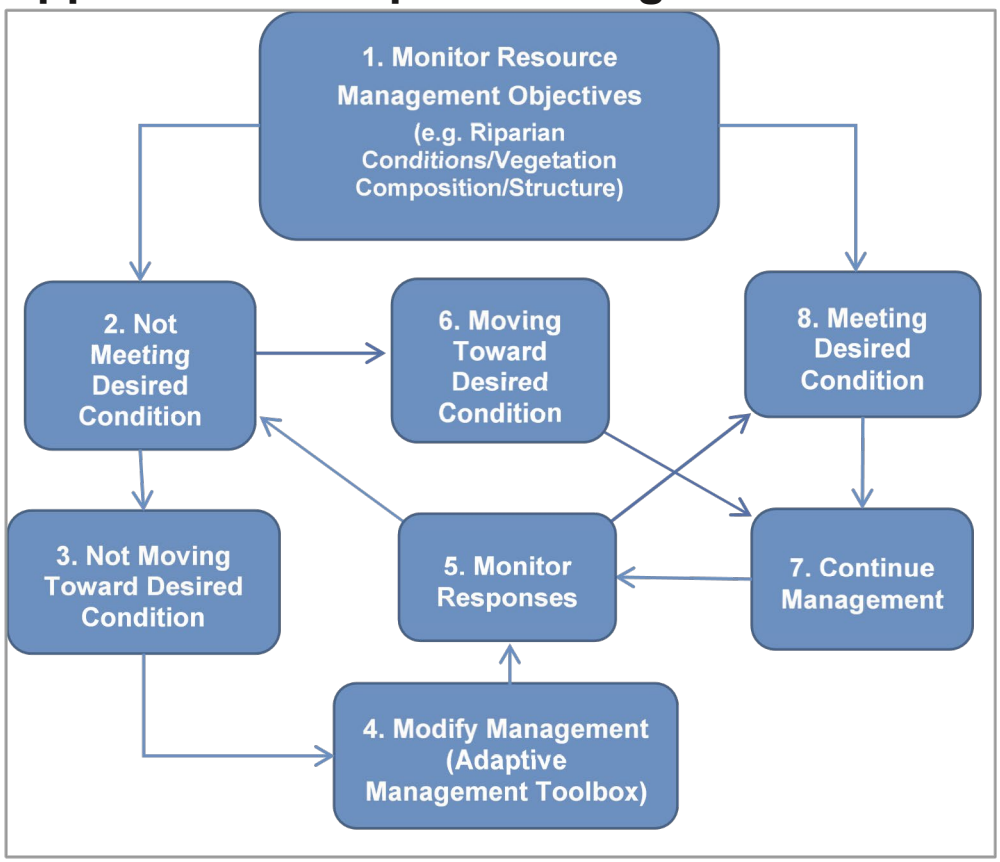

Figure 3. Adaptive management decision flowchart

Step 1: Monitor Resource Management Objectives—The Forest Service and Grazing Association evaluate whether the monitoring objective was met. Monitoring, as described in Figure 3, would be used to determine if resource objectives are being met. This step assumes that the correct indicator and value is being used and this step may be subject to reevaluation later in the process.

Step 2: Not Meeting Desired Condition—If the resource condition is not meeting the desired condition, a determination must be made if the resource is moving toward the desired condition, or not moving toward the desired condition. Move to number 3 for not moving toward desired condition or number 6 for moving toward desired condition. Designation of meeting or not meeting desired condition would be determined by the Forest Service and Grazing Association based on an evaluation of resource inventory data, stated Grasslands Plan objectives, and recommendations made by resource specialists.

Step 3: Not Moving Toward Desired Condition—If the resource condition is not being met and a significant gap exists between existing and desired condition with no indication of moving

toward desired condition, then the need for adaptive management changes are indicated. Proceed to number 4 to modify management (adaptive management toolbox).

Step 4: Modify Management (adaptive management toolbox)—If adaptive management changes are warranted, the Forest Service and Grazing Association would evaluate an adaptive option from the adaptive management toolbox (incorporated into the allotment management plan) and implement the option.

The Forest Service and Grazing Association should determine whether the failure to meet the resource objective is an infrequent occurrence or whether there is routine difficulty in meeting the objective. A one-time occurrence due to a unique variable may not be significant and may not require further evaluation or adaptive management changes. Routine difficulty in meeting the resource objective may indicate further evaluation and the need for adaptive management changes.

Evaluating current condition versus meeting or moving toward desired conditions is to be made through the use of long-term monitoring data. However, a simple and rapid qualitative analysis can be completed to compare current conditions with desired conditions, or use of the best available information. When the best available information or the rapid qualitative analysis indicates a need for an adaptive management change, the Forest Service and the Grazing Association will come to agreement on the adaptive management change(s) by choosing from the options listed in Appendix C – Adaptive Management Toolbox. The adaptive management changes will be considered temporary adjustments unless long-term monitoring data validates the change. In compliance with the Demonstration Project, “There will be no cuts in permitted AUMs without long term monitoring showing that livestock are principally responsible for not meeting or moving toward desired conditions, and that the cuts are the only ecologically practicable and economically feasible means available for meeting the desired condition” (USDA Forest Service 2006, p.17 #9).

Step 5: Monitor Responses—If adaptive management changes were implemented, a determination as to whether these changes are achieving or moving towards achieving the resource objective should be made. Monitoring, as described in Table 2, would be used to determine if resource objectives are being met. If resource conditions are meeting desired conditions after adaptive management changes are made (number 8), then management and monitoring would continue as planned. If resource conditions are not meeting desired conditions, a determination must be made if the resource is moving toward desired condition or not moving toward desired condition (number 2, then number 3 or number 6). If the changes are not effective and resource conditions are not moving towards desired conditions, then the Forest Service and Grazing Association must determine what additional adaptive management actions are needed (number 3 then number 4).

If failure to implement the adaptive management changes is not related to the design or inability to implement the adaptive action by the Grazing Association member, and the Grazing Association's Member performance and compliance is an issue or is repetitive, follow the current grazing agreement and rules of management.

Step 6: Moving Toward Desired Condition—If the resource condition is moving toward desired condition, proceed to number 7.

Step 7: Continue Management—Continue current management and proceed to number 5.

Step 8: Meeting Desired Condition—If the resource condition is being met or is moving toward desired condition, proceed to number 7.

Appendix C: Adaptive Management Toolbox

In addition to the proposed actions, the following tools may be used to help meet objectives if the initial proposals or adaptive management options do not work or become impossible to implement. An interdisciplinary team would be convened to determine if a tool may be used. The Line Officer would determine whether analysis in the environmental assessment is sufficient or whether further analysis under the National Environmental Policy Act is required. Authorized use could be adjusted annually to account for situations that require additional resource protection, including but not limited to drought, grasshopper outbreaks, and over-utilization of a pasture. These changes would be temporary in nature and normally encompass a single grazing season. However, if a resource has been severely affected, adjustments may be of longer duration. The district ranger would make the final decision.

Use of the tools "adjust stocking rate" and "adjust stocking levels" would be utilized only after implementation of other tools has failed to meet objectives. While long-term trend and condition information is preferred, the lack of such information should not delay evaluating the current resource condition and need for adaptive management changes. In compliance with the Demonstration Project, "There will be no cuts in permitted AUMs without monitoring showing that livestock are principally responsible for not meeting the desired condition, and that the cuts are the only ecologically practicable and economically feasible means available for meeting the desired condition" (USDA Forest Service 2017). x Adjust animal unit months (stocking rate) by number of head and/or number of days. x Adjust animal unit months based on average cow size.

x Adjust authorized use or allowable utilization (stocking level). x Adjust season of use (early, mid and late, or winter). x Allow early turnout on native pastures 1 out of 3 years on inventory permits. x Utilize non-native grass pastures early to defer grazing on native grasses.

x Defer native pastures until June 1 or until development of the three-and-a-half leaf stage for key graminoid species.

x Change class of livestock (yearlings). x Construct and remove cross fences. x Construct cross fence to create riparian unit; allow grazing under riparian grazing dates.

x Construct fence to exclude livestock from areas of concern (riparian, woody draws, springs, wetlands, etc.).

x Construct livestock water developments (well, pipeline, tanks, windmill, reservoir, dugout, or spring).

x Construct temporary fence to control livestock distribution patterns. x Construct water gap to limit livestock access on stream. x Construct hardened stream crossings. x Early weaning of calves.

- Fertilize crested wheatgrass areas.
- Harden braided two tracks with gravel material
- Hay or cut and leave introduced grass species to increase palatability and use by livestock.
- Implement the most appropriate grazing system: Deferred grazing, rest rotation, twice over system, or other approved system.
- Interseed or reseed pasture with native grass and/or forb species.
- Manage salt and supplement locations to modify livestock grazing behavior and distribution patterns.
- Manage water availability access at water developments to facilitate livestock movement.
- Move winter feeding areas off of National Forest System lands where feasible.
- Construct water bars on eroding trails and roads.
- Reallocate pastures by changing allotment boundaries.
- Remove and reclaim water development (well, pipeline, tanks, windmill, reservoir, dugout, or spring).
- Rest an allotment for one or more seasons.
- Scarify clubmoss areas within a pasture.
- Stabilize headcuts using natural materials.
- Stabilize stream banks by planting riparian vegetation.
- Use a range rider to disperse livestock for proper utilization.
- Use herbicide, mechanical methods, and/or prescribed fire to remove Rocky Mountain juniper and exotic cool season grasses, and other woody species occurring outside of the reference state. Utilize herbicide treatments as prescribed by the Dakota Prairie Grasslands Noxious Weed Management Project Final Environmental Impact Statement and Record of Decision (USDA Forest Service 2007).
- Use prescribed fire to manipulate vegetation or reduce hazardous fuels on National Forest System lands. The Line Officer would determine whether analysis in the environmental assessment is sufficient or whether further analysis under the National Environmental Policy Act is required.

Appendix D: Allotment Acreages

Table 17. Acreages of allotments in the Deep Creek Vegetation Management Project

Allotment	Federal	State	Private	Total
008	1,200	0	45	1,245
012	1,440	480	655	2,575
013	960	0	0	960
018	523	0	0	523
022	477	0	0	477

023	320	0	0	320
044	1,599	157	0	1,756
056	160	0	0	160
058	160	0	0	160
084	720	0	0	720
085	710	0	0	710
087	1,756	0	0	1,756
090	784	0	0	784
094	642	0	456	1,098
095	2,079	0	1,625	3,704
096	320	0	0	320
108	2,029	0	0	2,029
109	480	0	0	480
110	1,438	0	0	1,438
120	165	0	37	202

*Allotment acreages may change as GIS layers are updated.

Appendix E: Proposed Action Maps

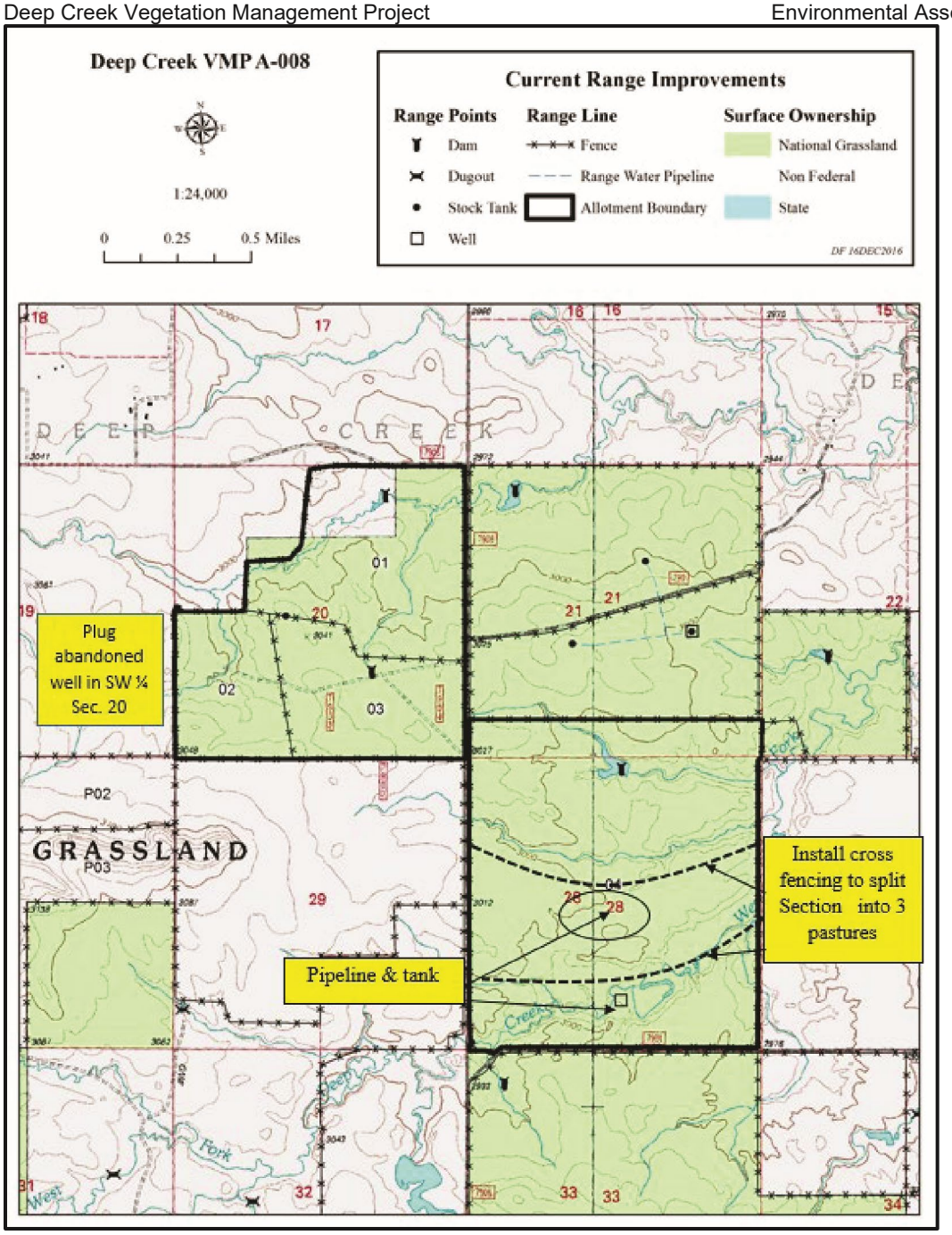

Figure 4. Allotment 008 proposed initial activities

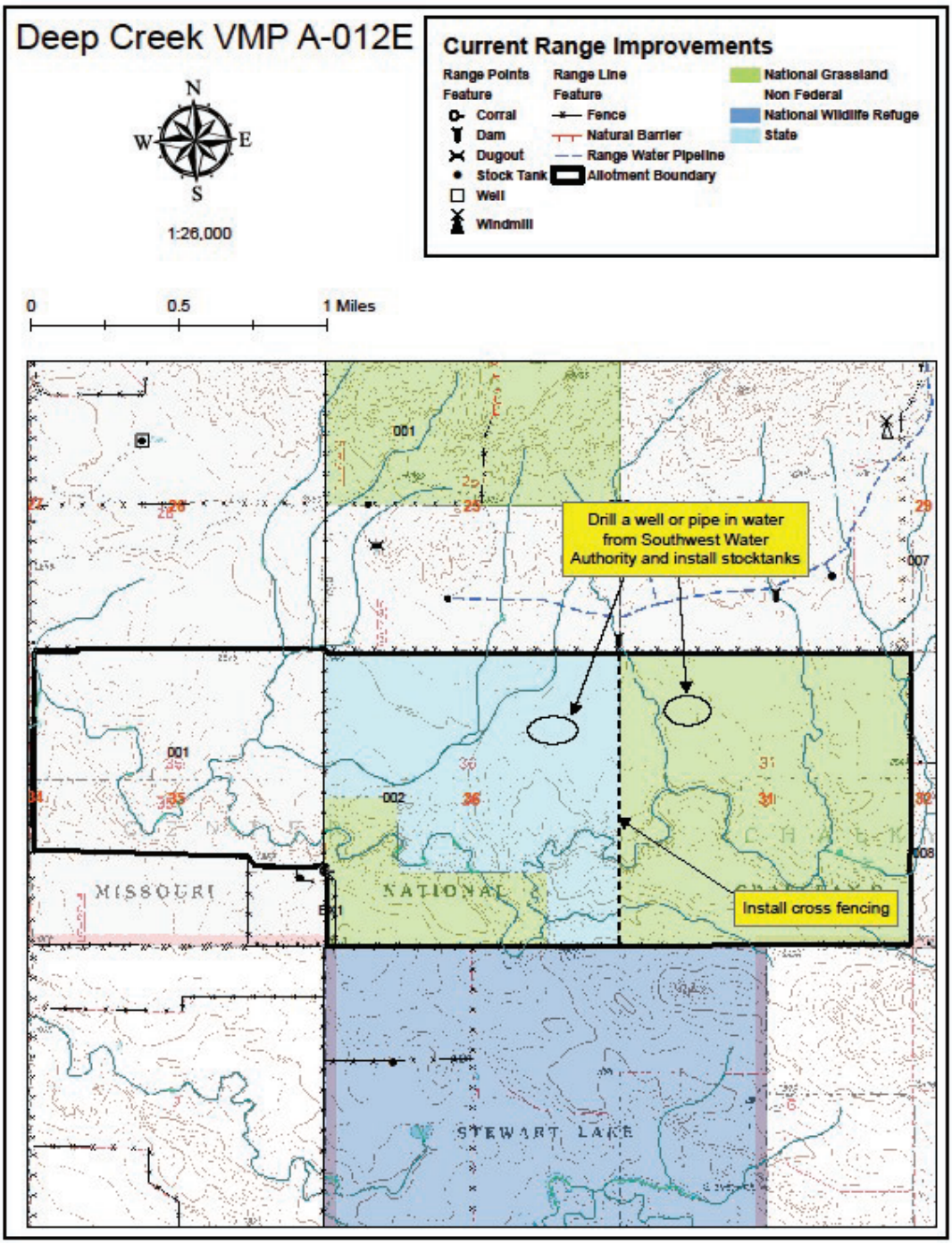

Figure 5. Allotment 012 E

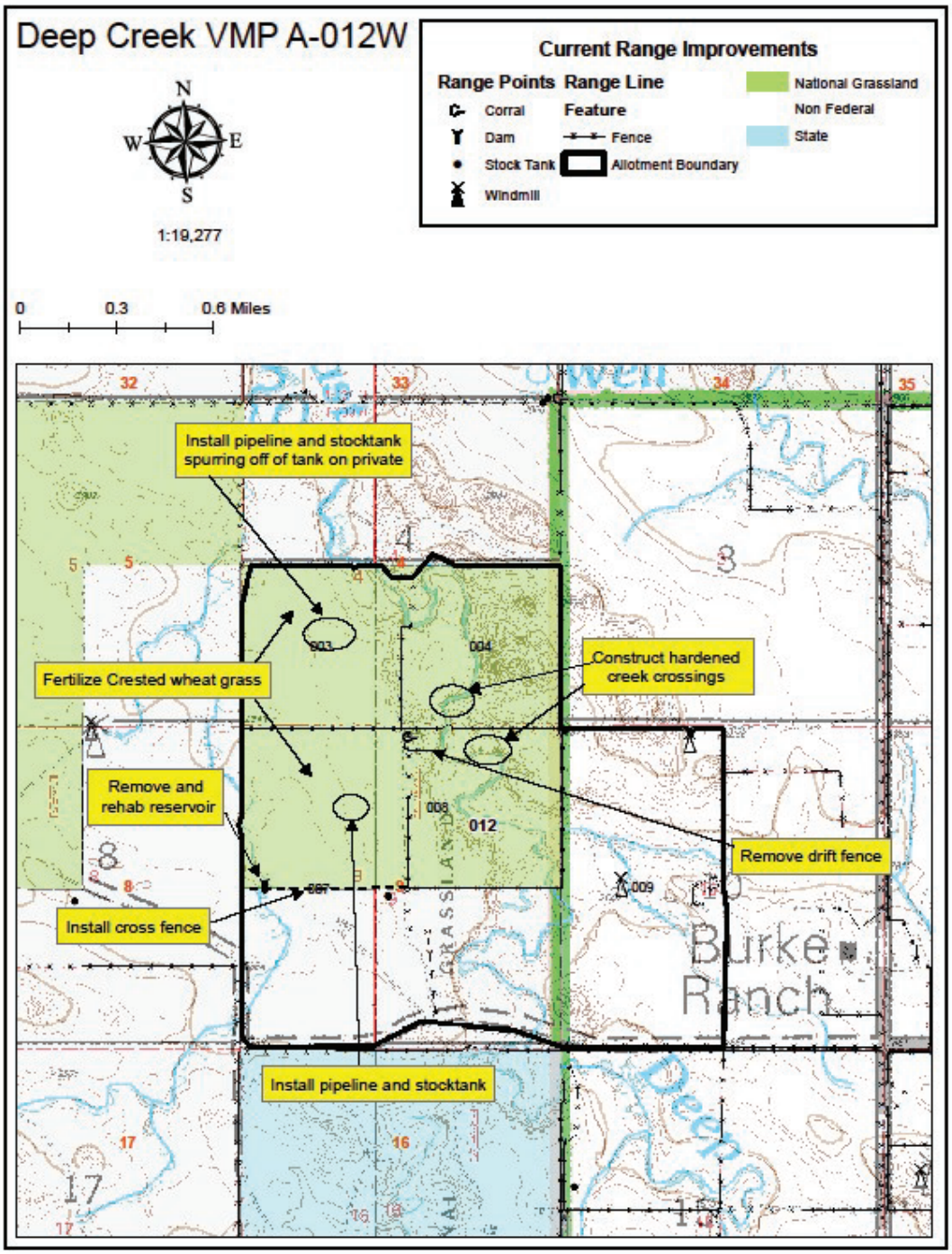

Figure 6. Allotment 012 W

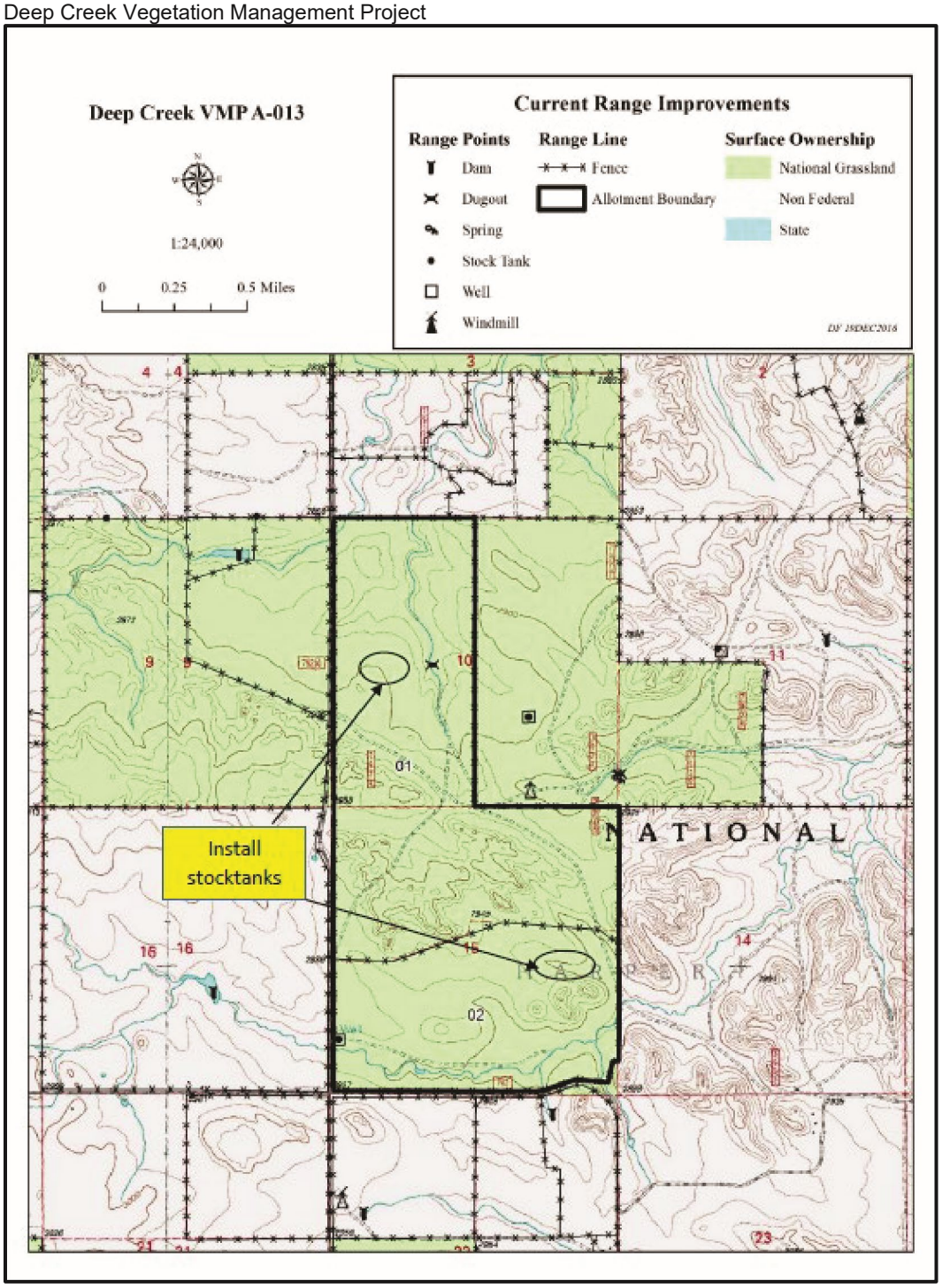

Figure 7. Allotment 013

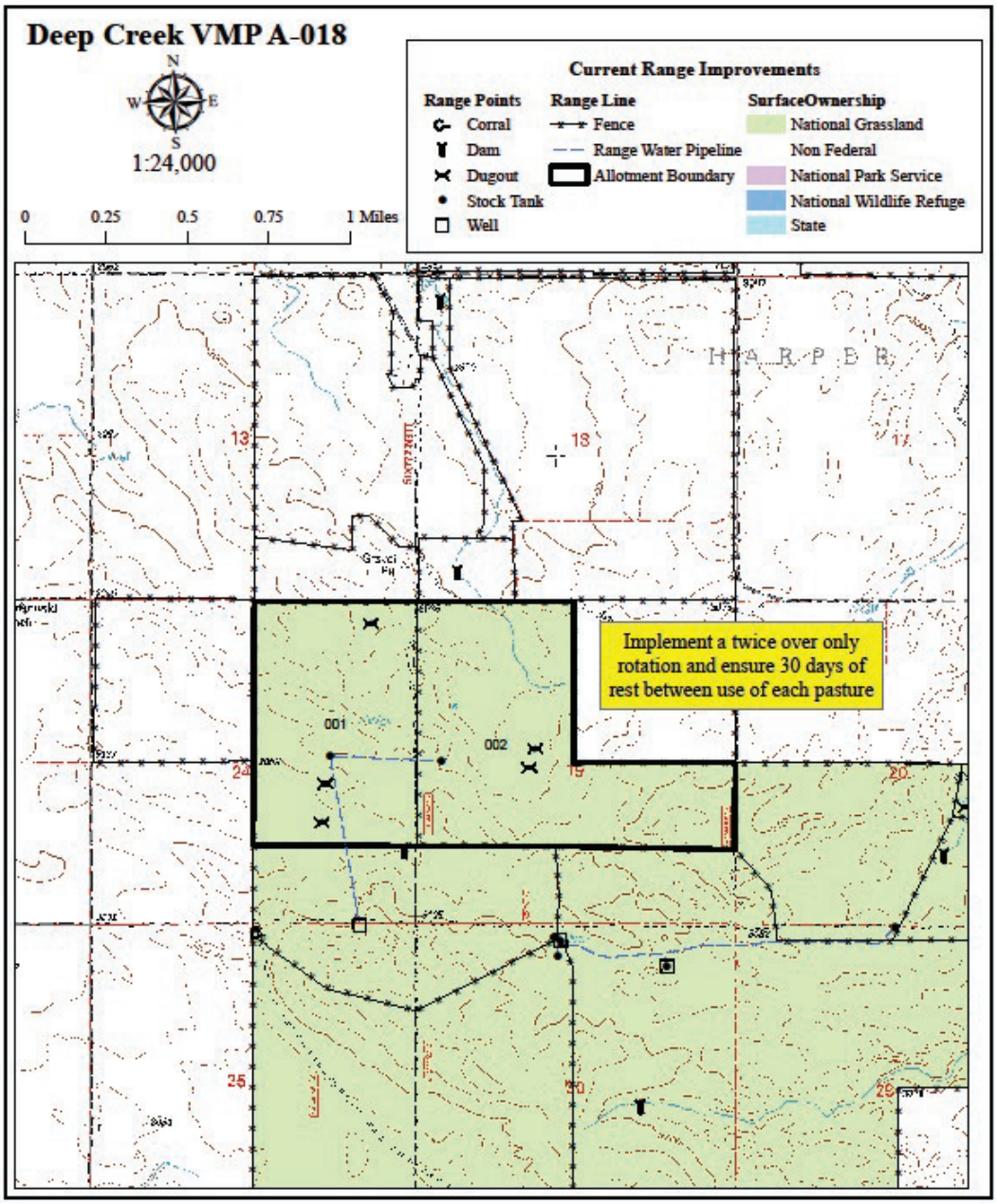

Figure 8. Allotment 018

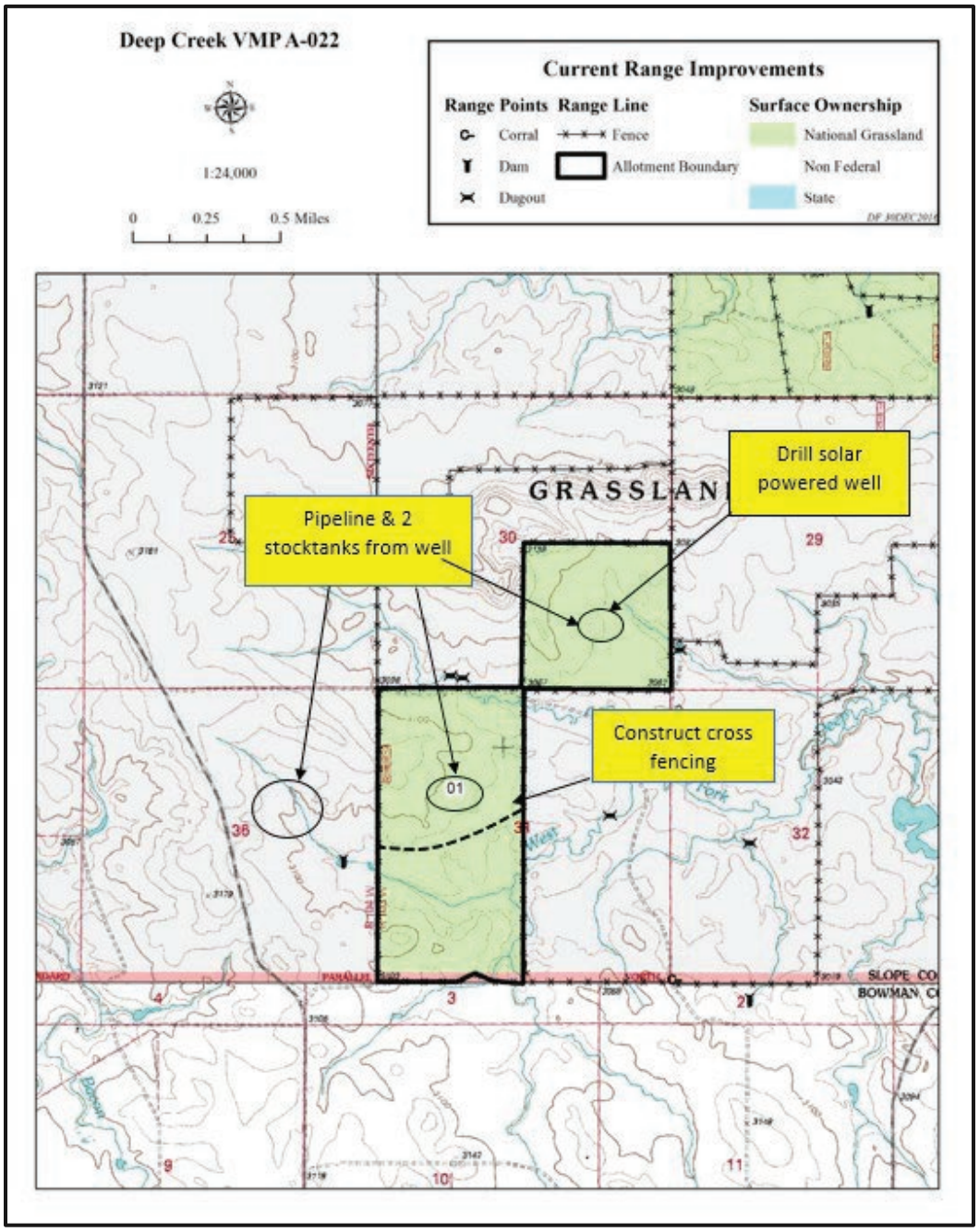

Figure 9. Allotment 022

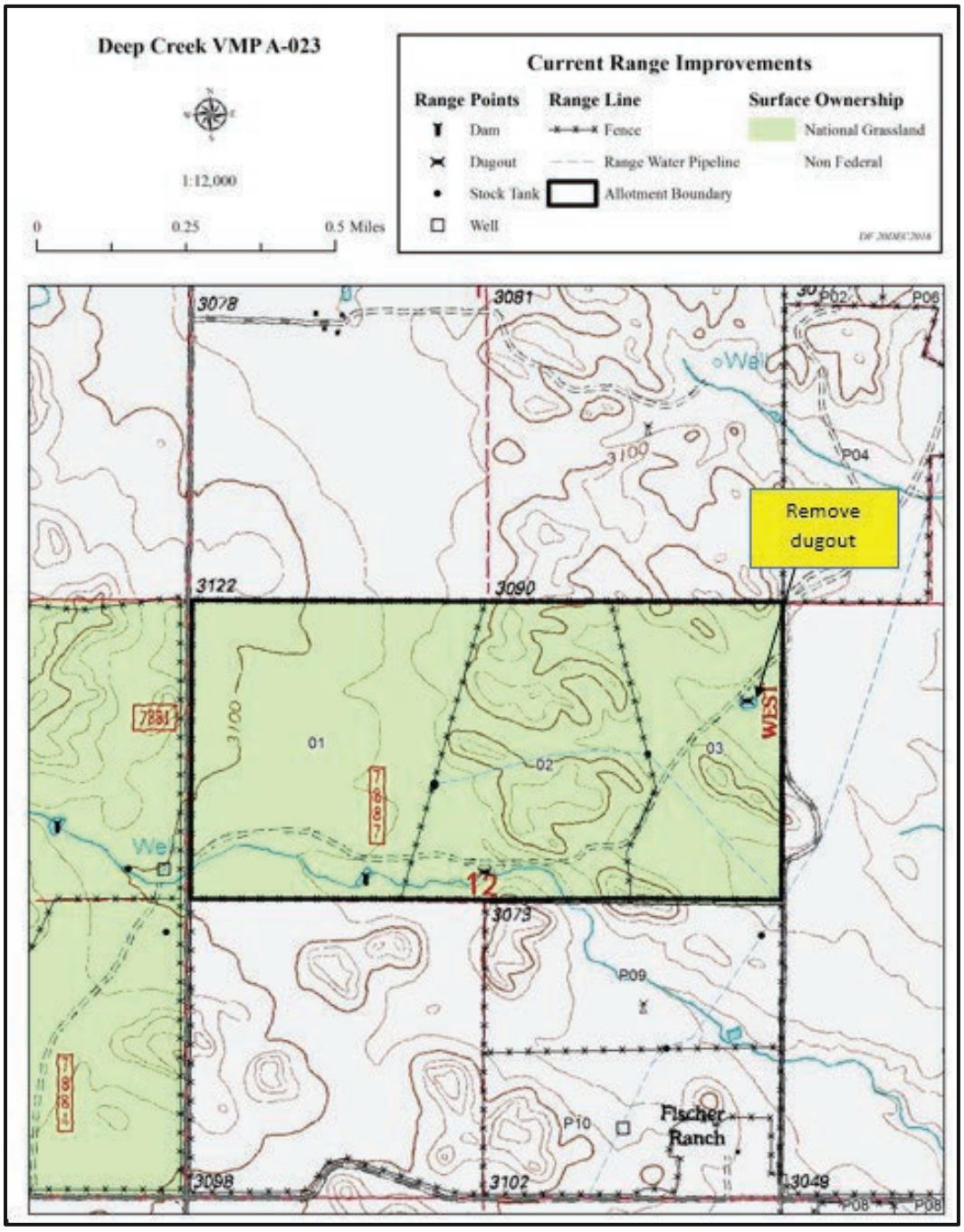

Figure 10. Allotment 023

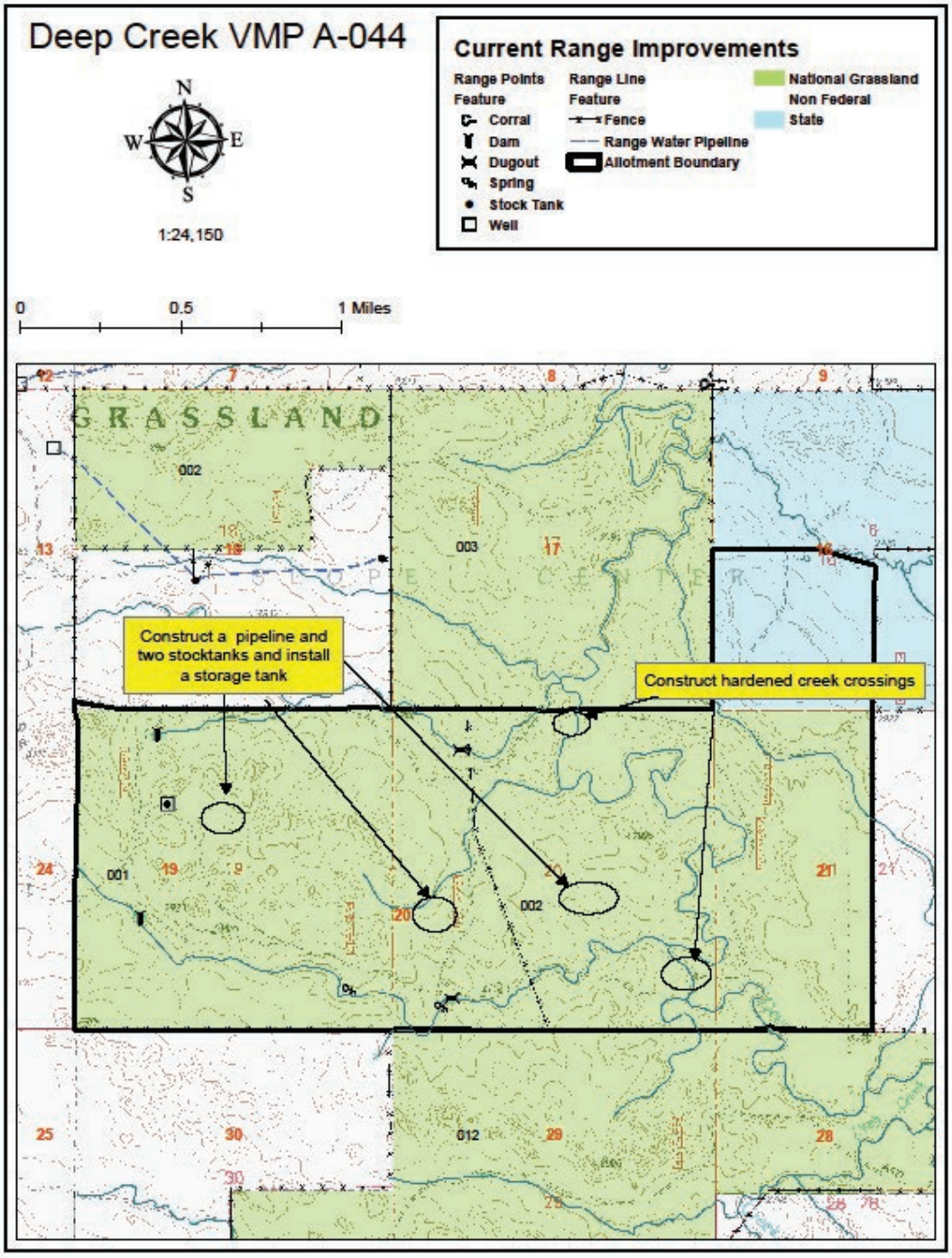

Figure 11. Allotment 044

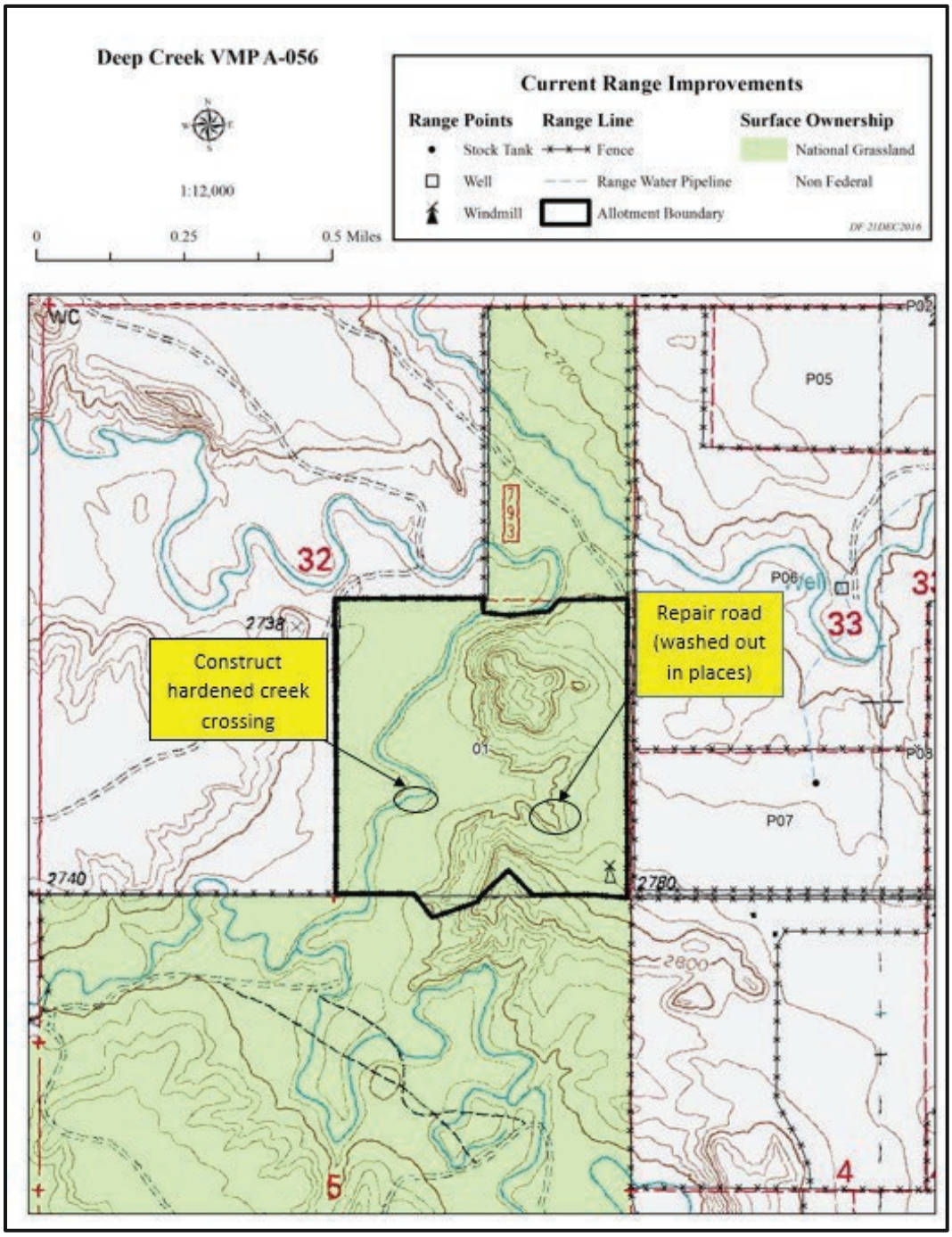

Figure 12. Allotment 056

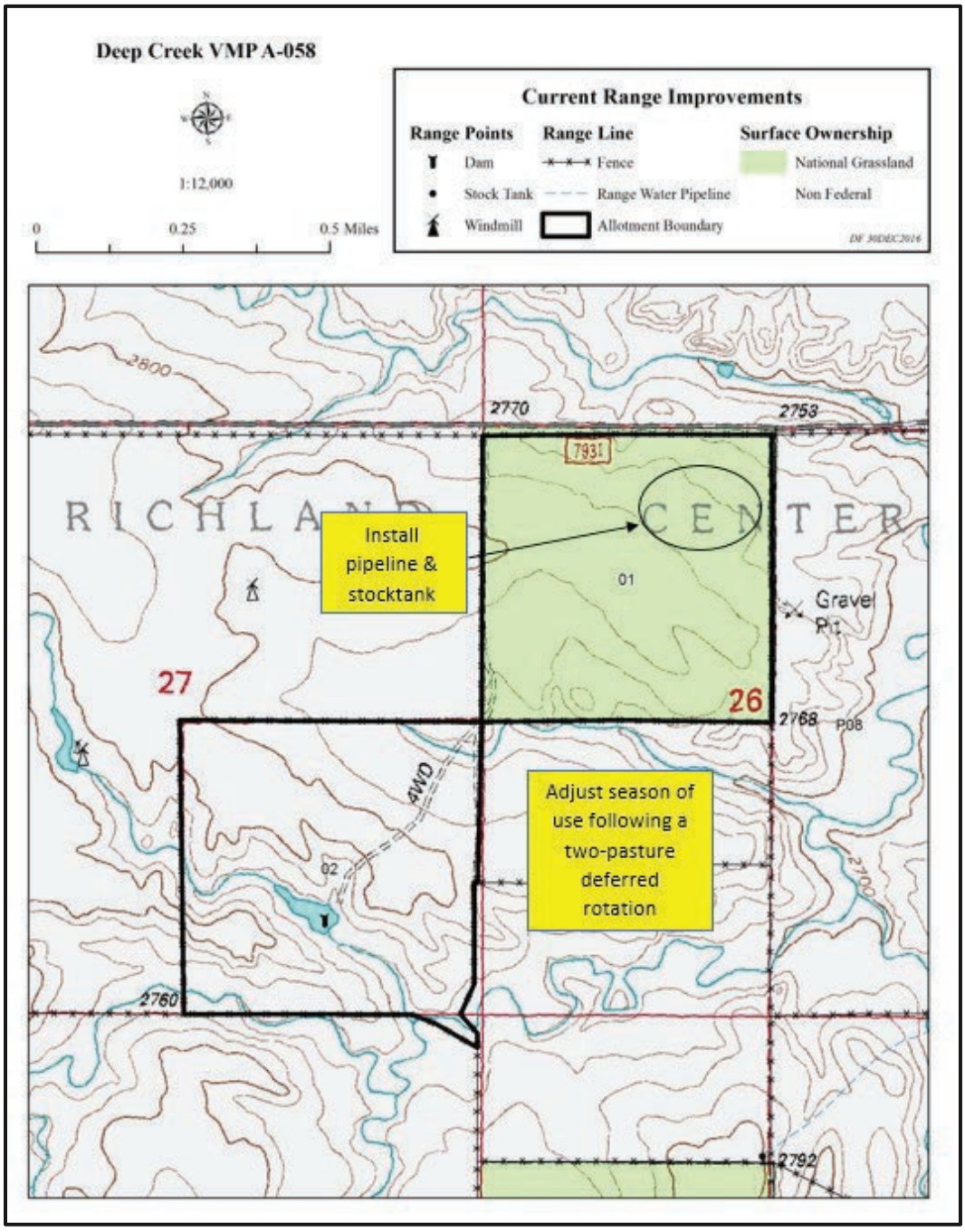

Figure 13. Allotment 058

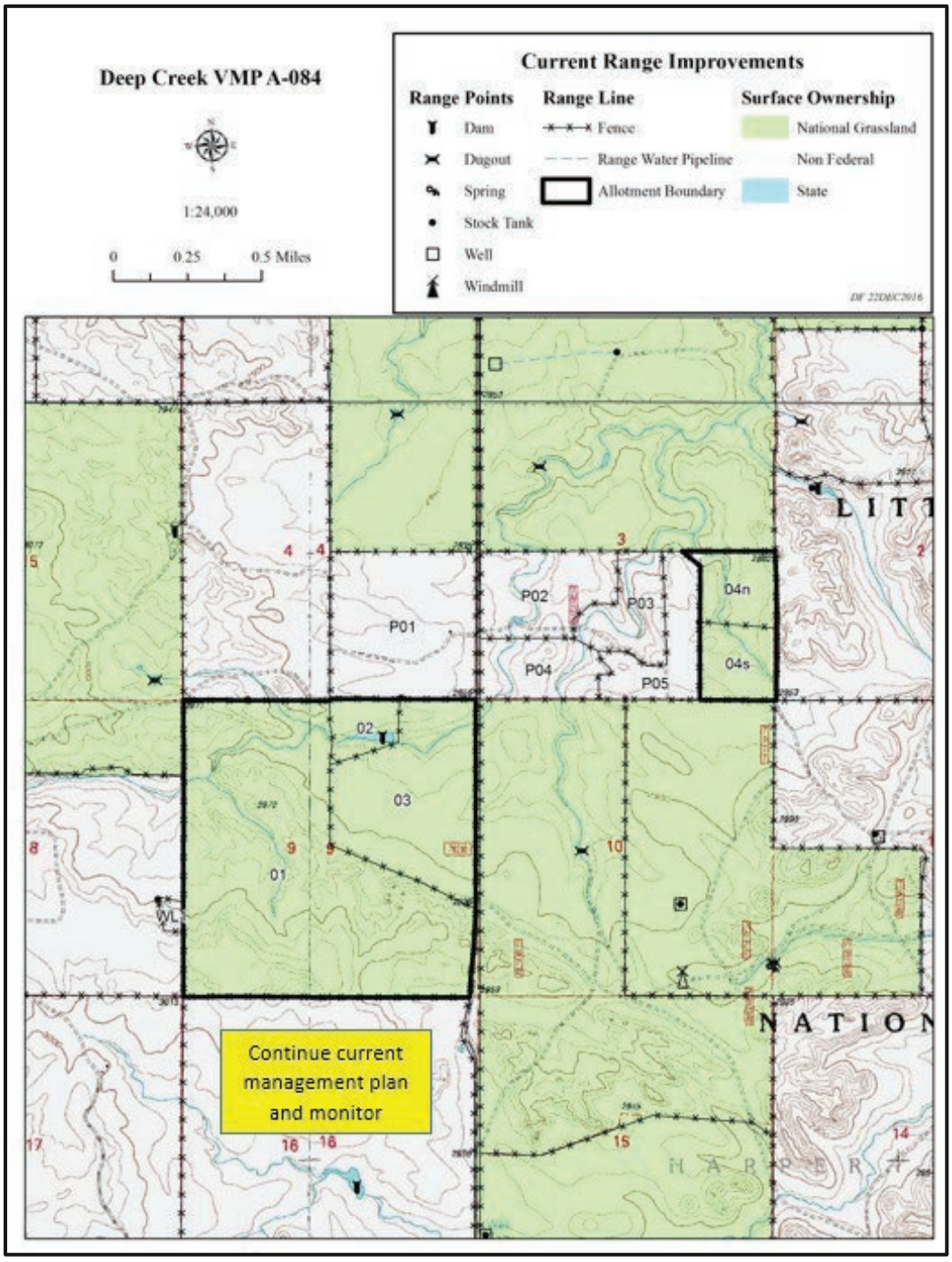

Figure 14. Allotment 084

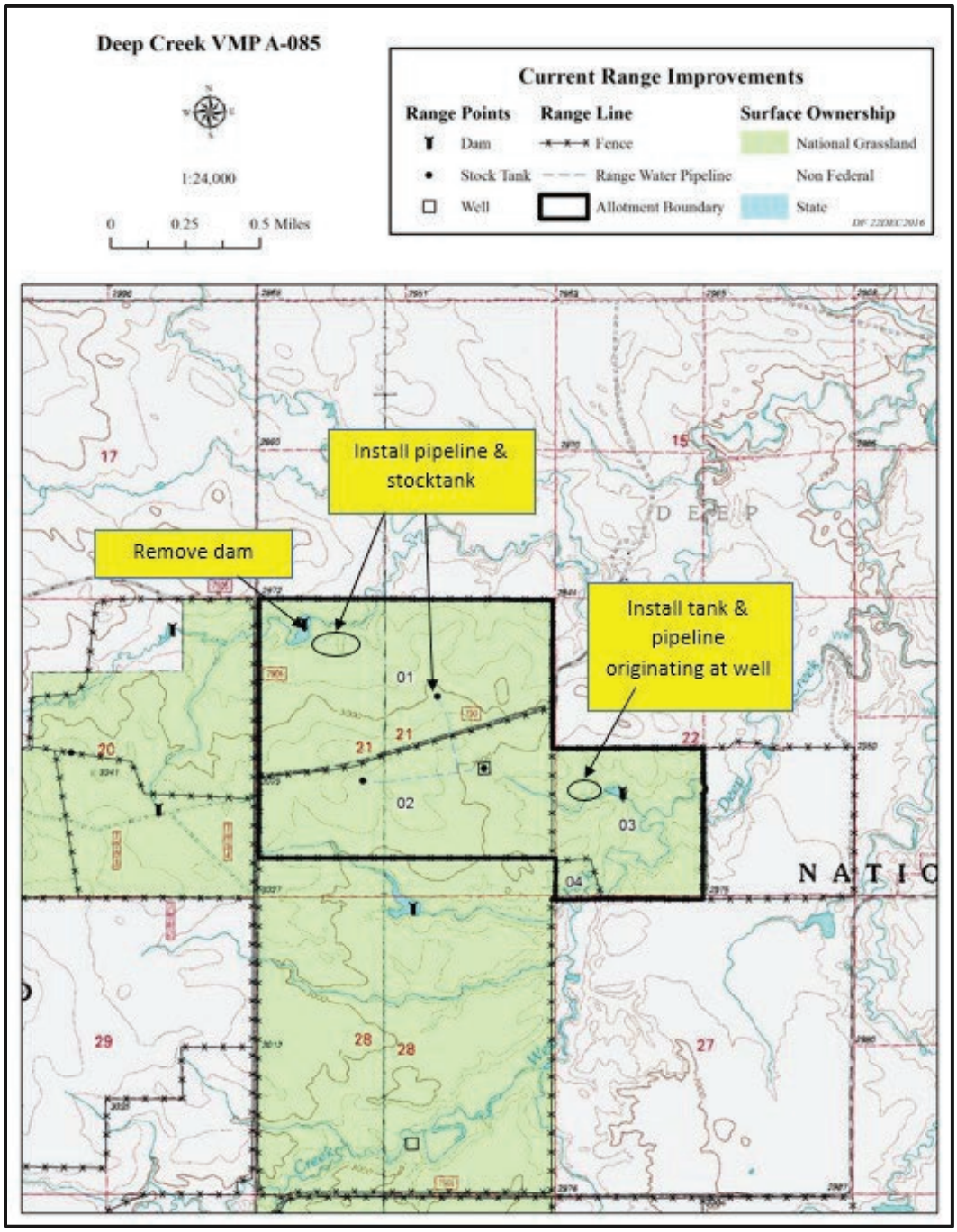

Figure 15. Allotment 085

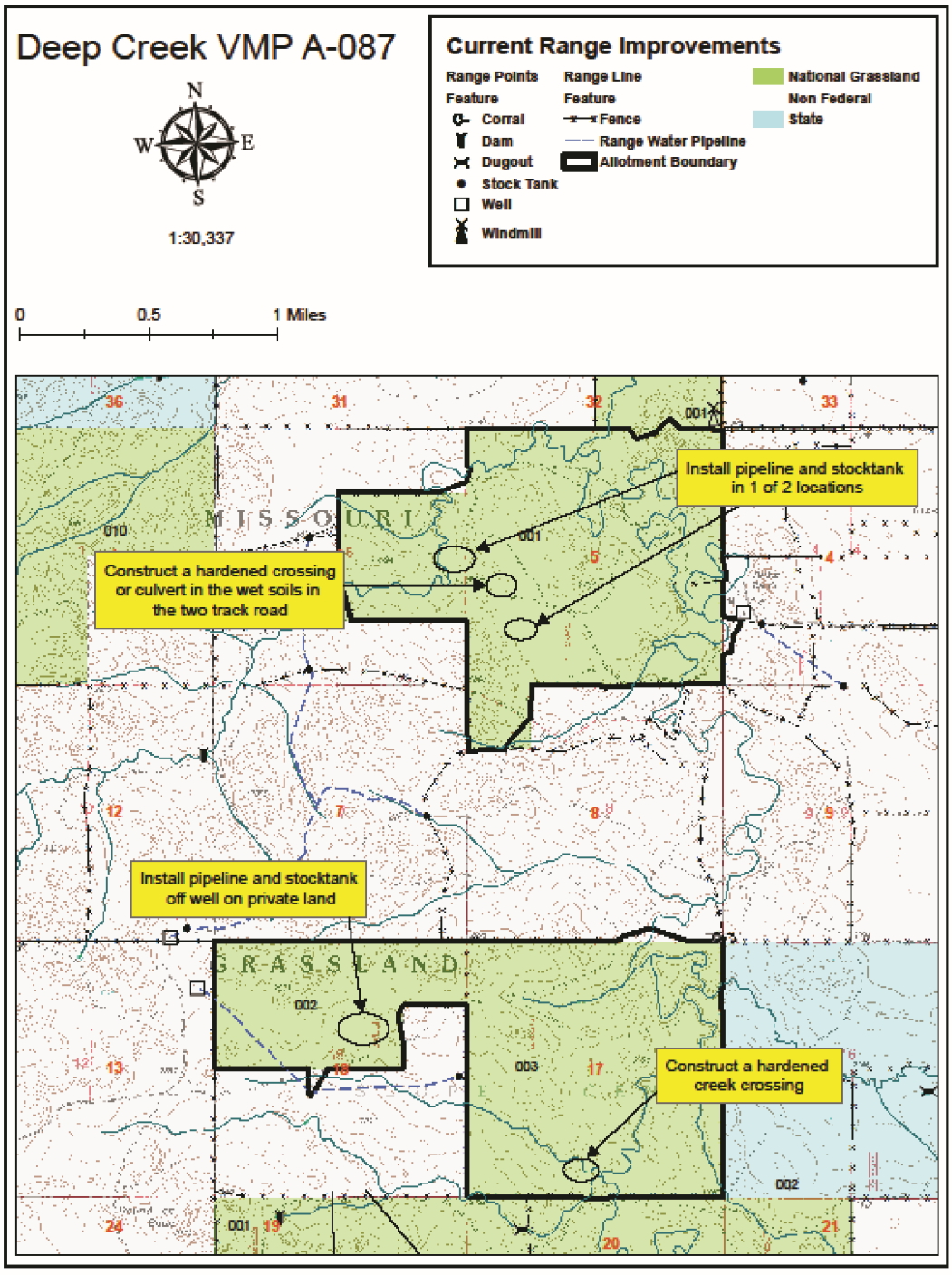

Figure 16. Allotment 087

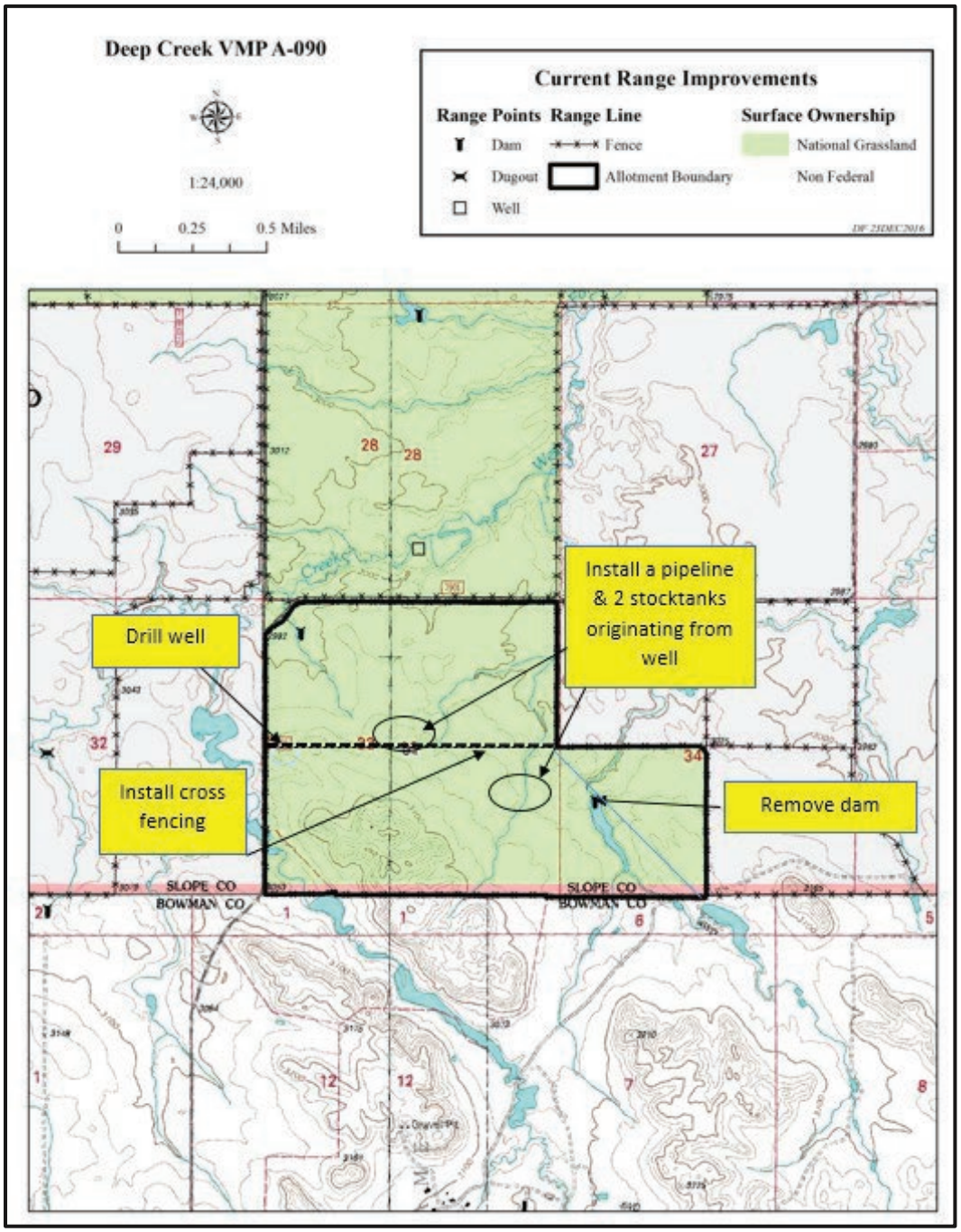

Figure 17. Allotment 090

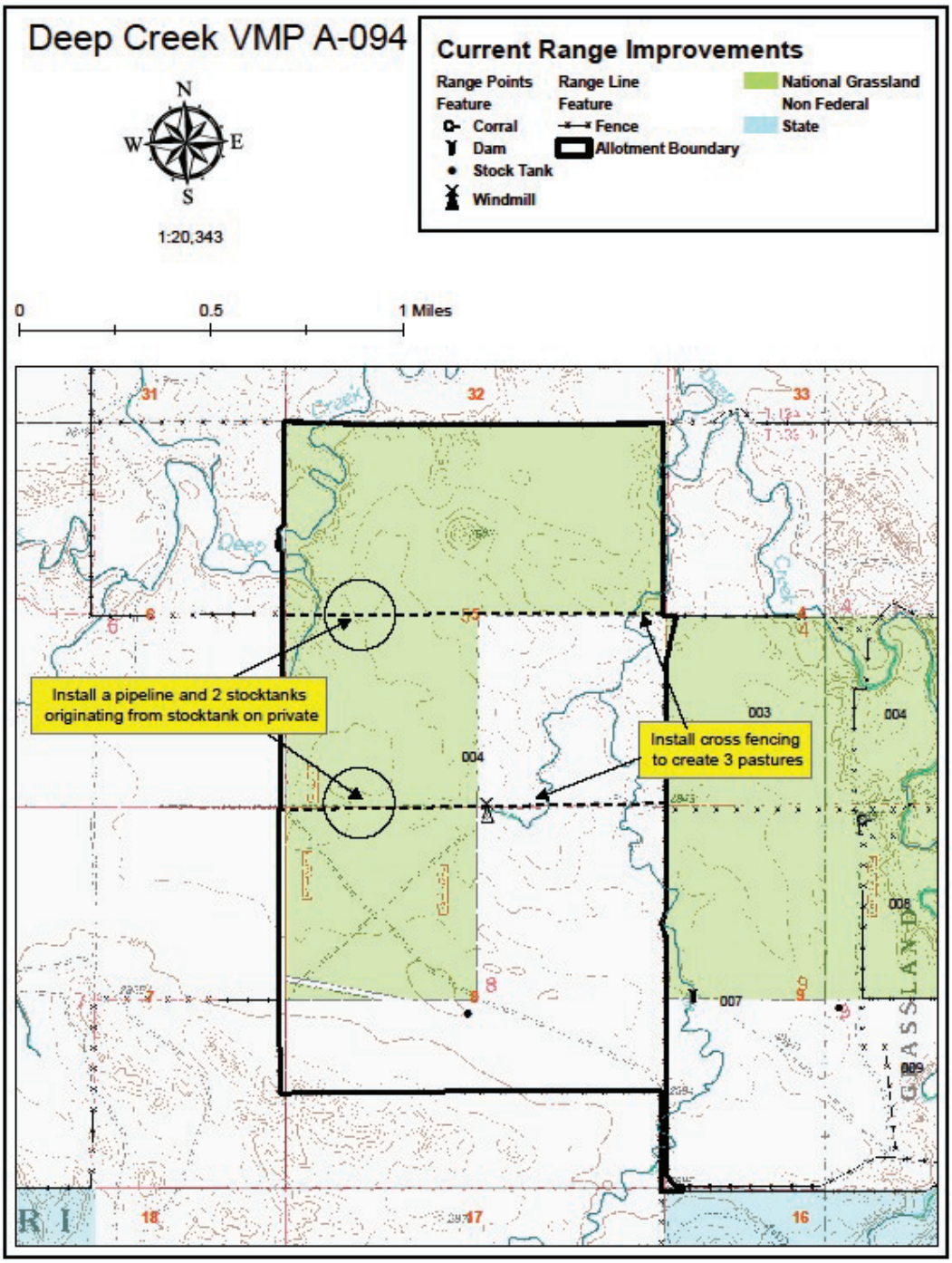

Figure 18. Allotment 094

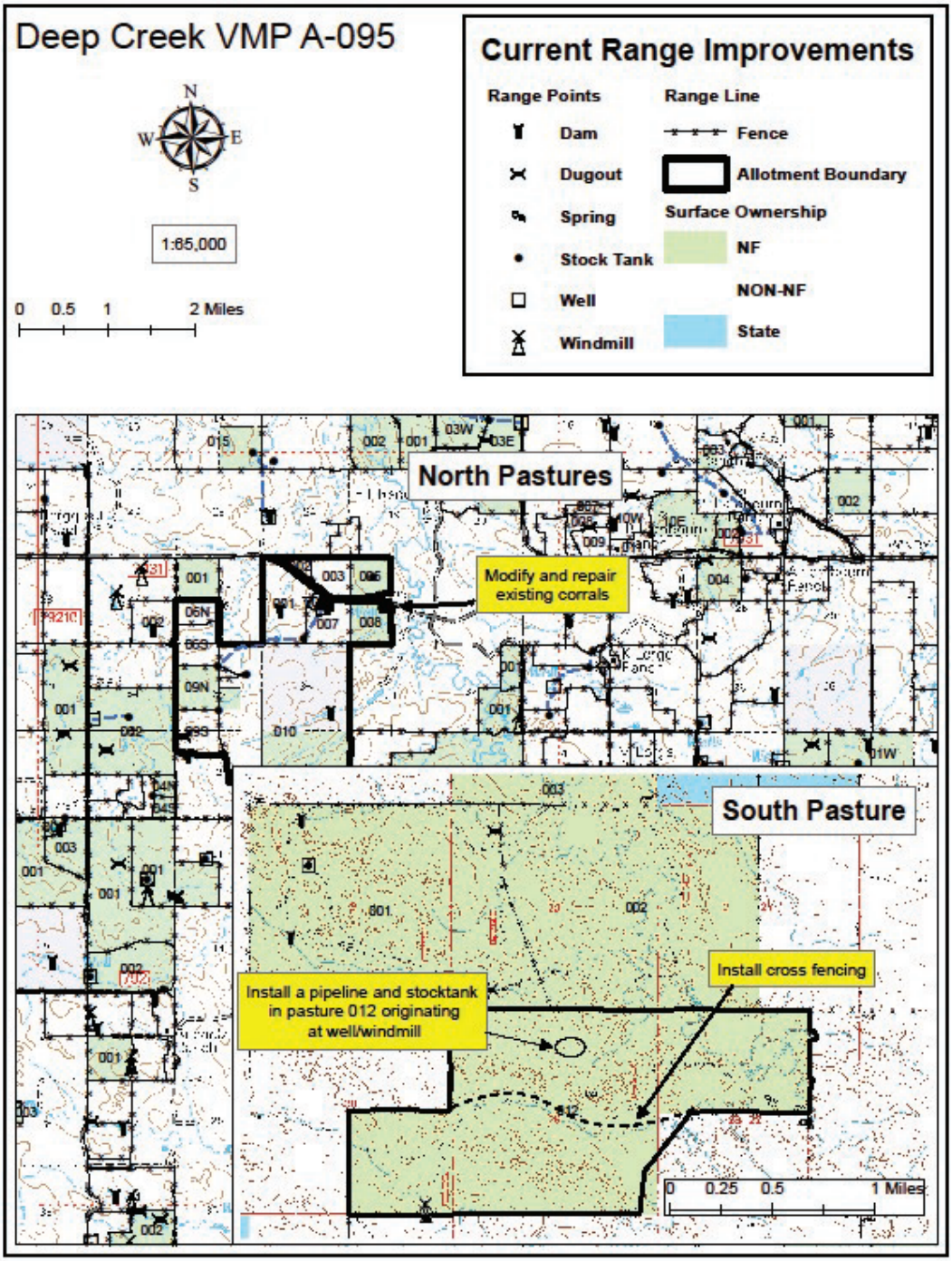

Figure 19. Allotment 095

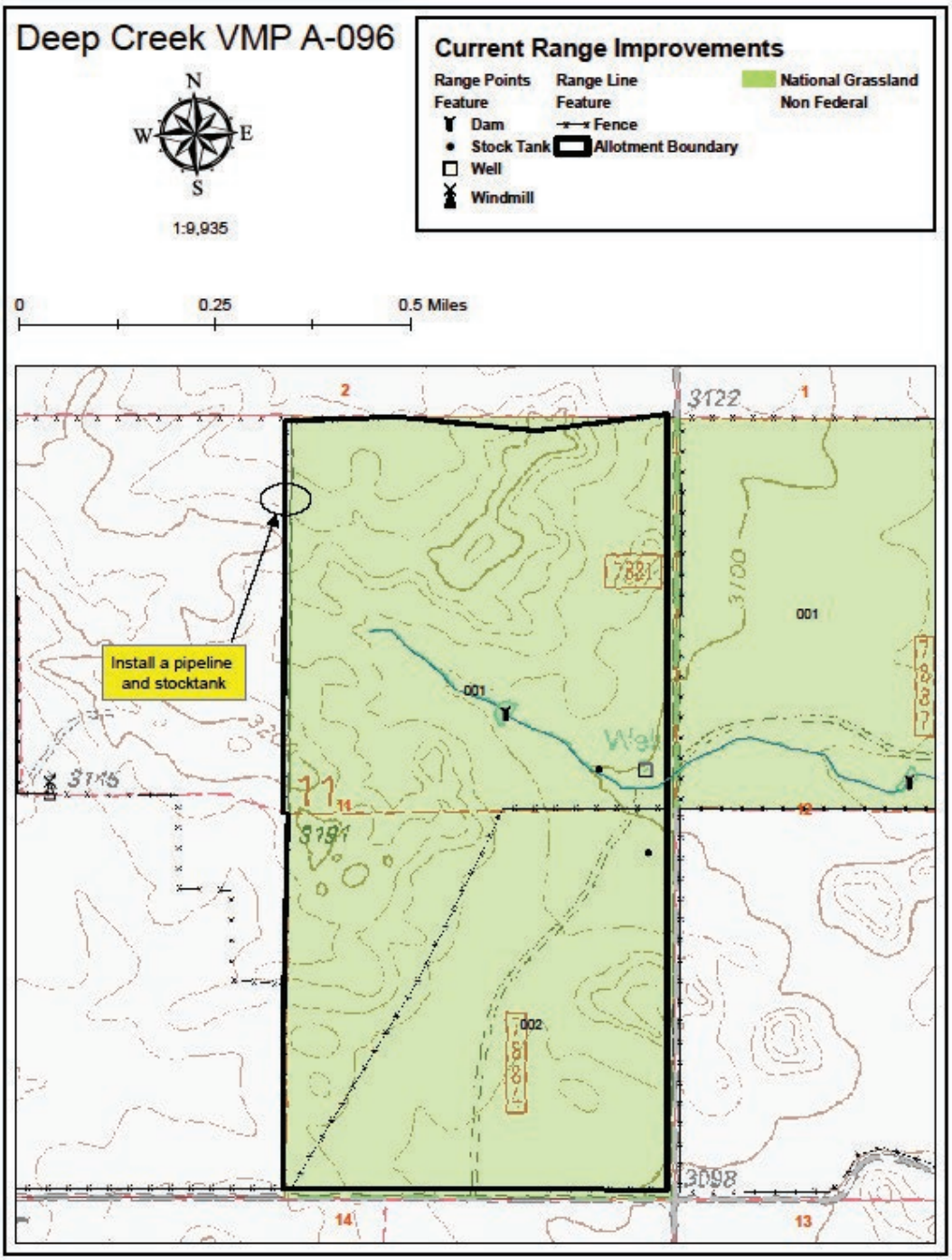

Figure 20. Allotment 096

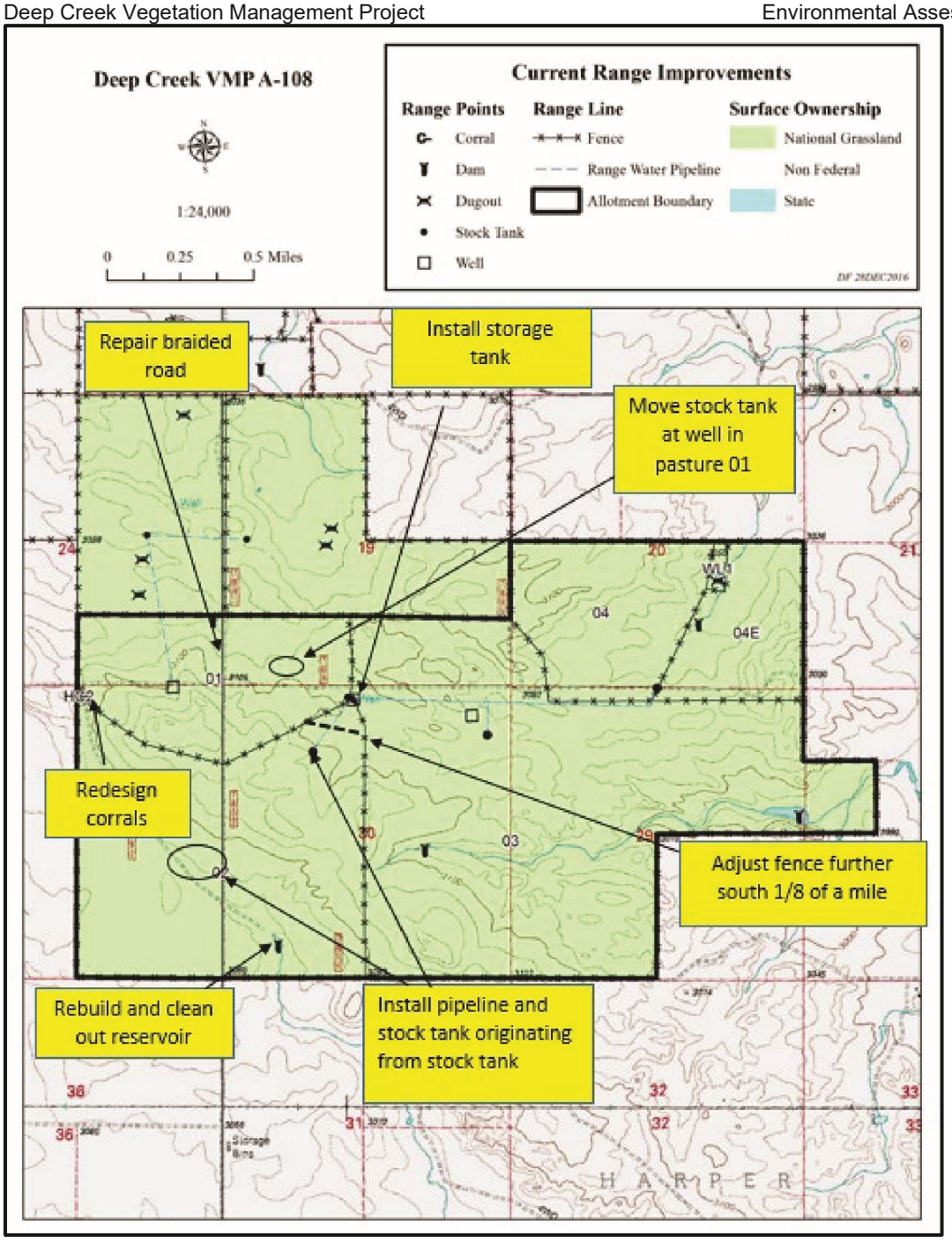

Figure 21. Allotment 108

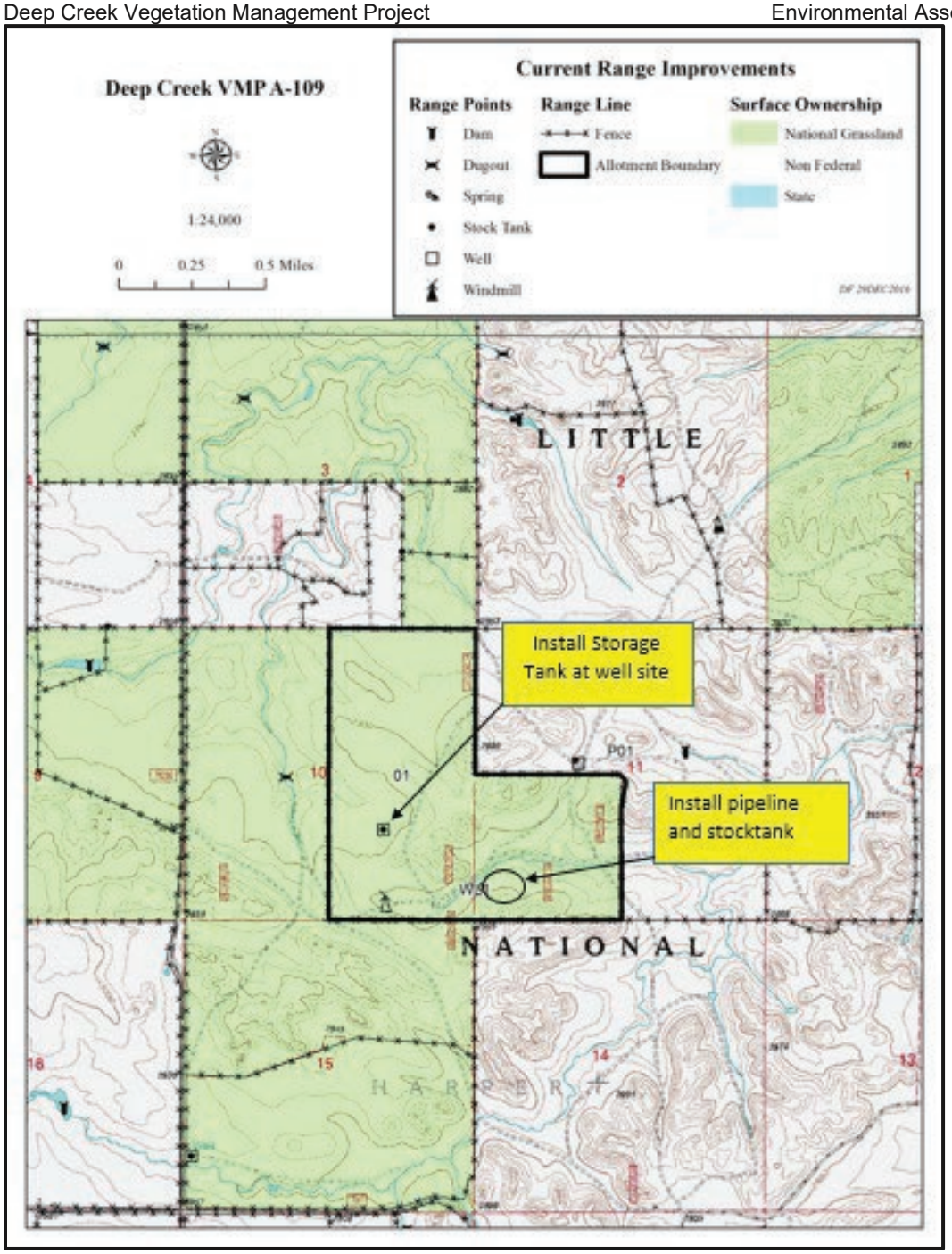

Figure 22. Allotment 109

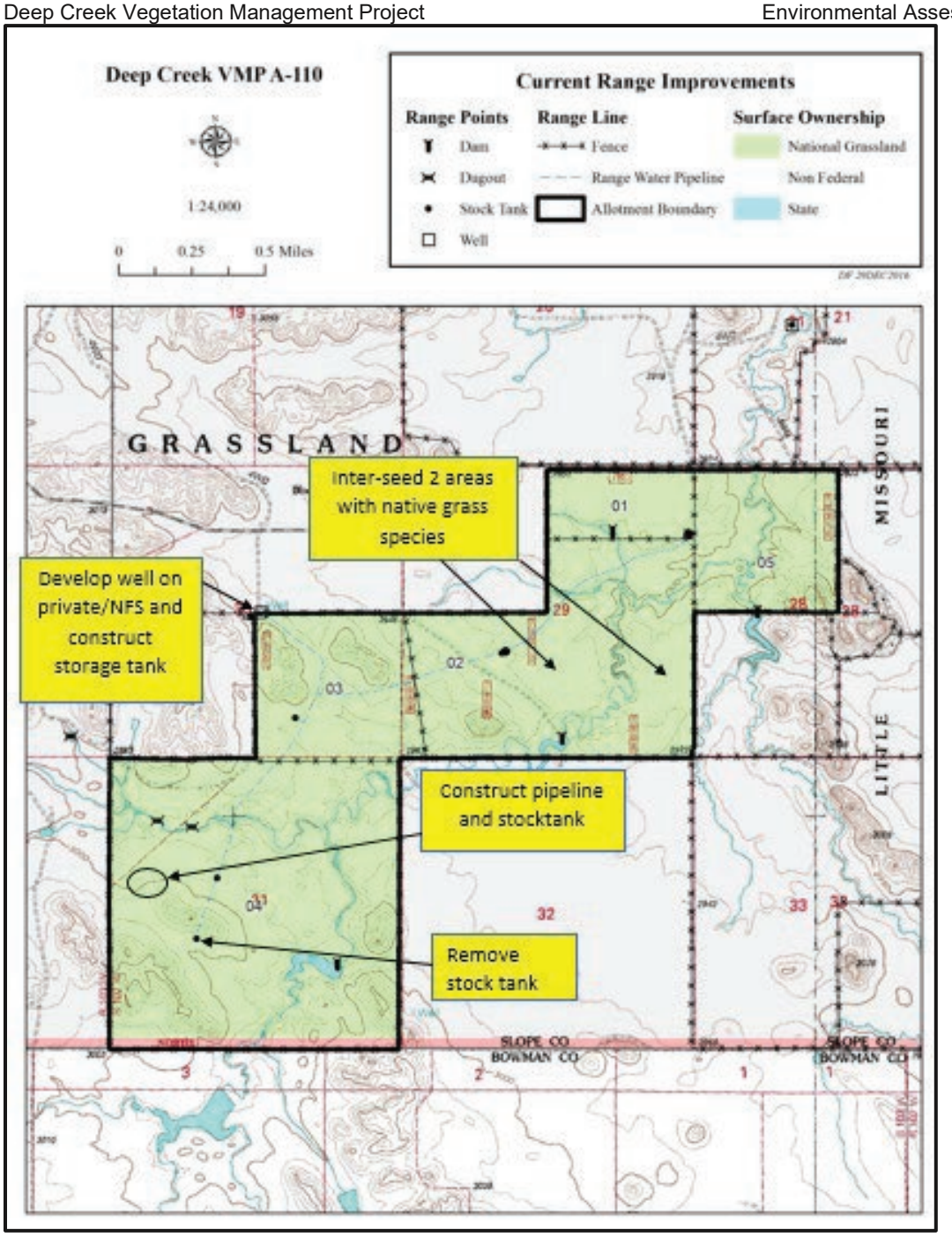

Figure 23. Allotment 110

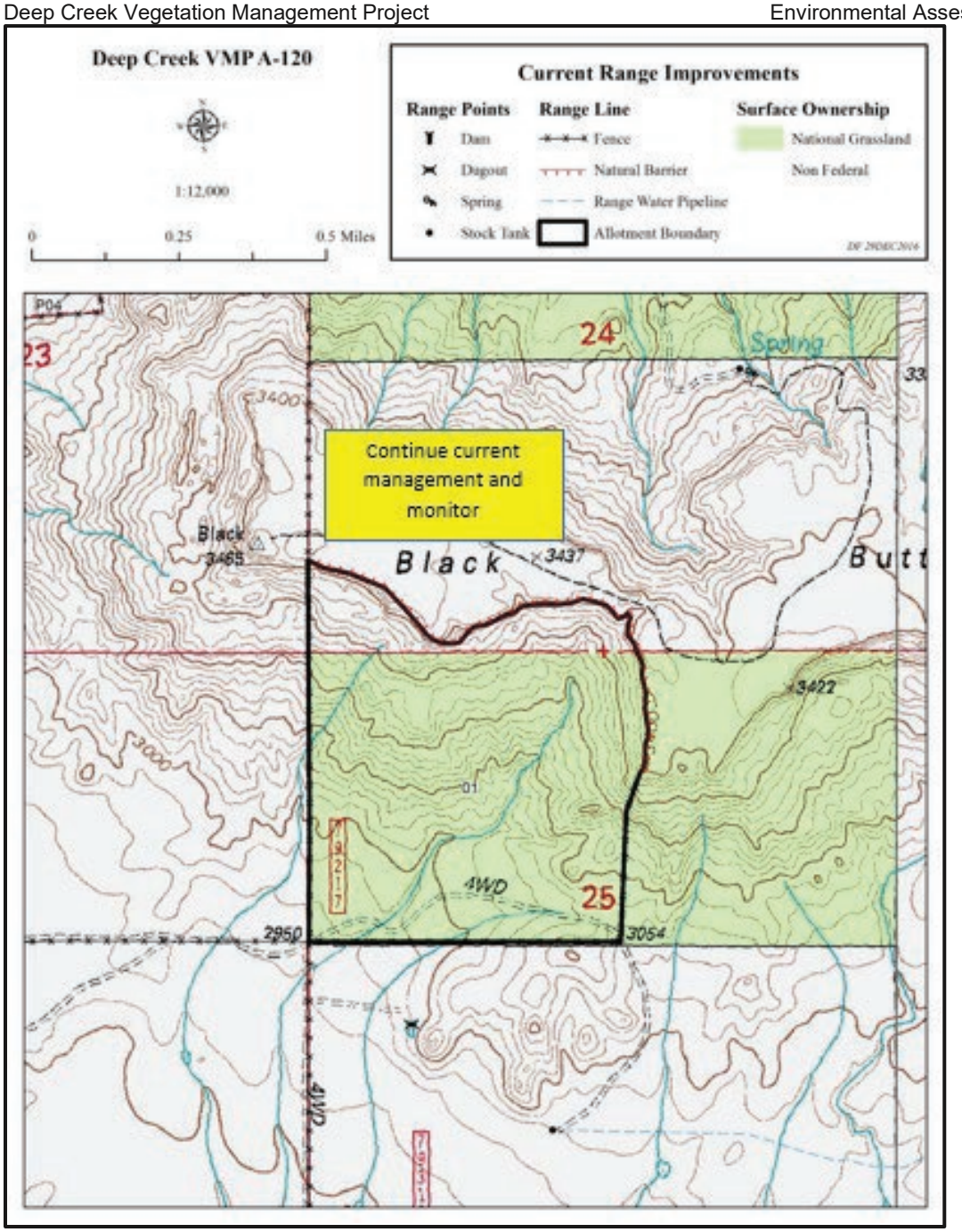

Figure 24. Allotment 120

PO Box 920
Bowman, ND 58623
701.523.5531 Ext 3
bowsloscd@ndsupernet.com

Bowman Slope
Soil Conservation District

May 27, 2020

USDA Natural Resources Conservation Service
PO Box 1458, 220 East Rosser Avenue
Bismarck, ND 58502

Dear Natural Resources Conservation Service,

This letter is in support and partnership of the Little Missouri Grazing Association (LMGA) Deep Creek Watershed Conservation Project. The Bowman-Slope Soil Conservation District (SCD) and the LMGA have been long standing partners in delivering conservation programs and education to farmers and ranchers in Slope County, ND.

The Bowman-Slope SCD sponsored and implemented a 319 Watershed Conservation Project in the Deep Creek watershed in 2005-2010. The LMGA and farmers/ranchers in the Deep Creek Watershed were very active in installing conservation practices and participating in educational events to learn more about conservation and natural resources management. The one missing piece in this project was the ability to install practices on the federal lands at that time. Many of these ranches are very intermingled private and federal lands and in most cases the practices that were implemented on private land were also needed on the federal land but could not be installed due to USFS plans not being current. Through this project, the LMGA has thoroughly planned and documented the needed practices, they have worked with the USFS on planning and has the commitment from the permittees to install and implement the conservation practices. With our years of experience implementing grant projects, good planning and having the "on-the-ground" farmer/rancher commitment is crucial to the successful implementation and outcomes of projects.

The Bowman-Slope SCD will partner with the LMGA in this project by assisting producers with practice planning, tree planting planning and implementation, grazing management education and technical assistance, the availability of a No-Till Drill for seedings, technical assistance and support to the LMGA for project management, grant reporting, and conservation education. The SCD can also assist by helping producers leverage federal dollars with other non-federal cost-share sources and conservation programs.

The Bowman-Slope SCD has complete confidence in the LMGA's leadership, staff, and producers to successfully implement this project and to implement sound conservation practices to improve and sustain natural resources. The Bowman-Slope SCD highly recommends the funding and implementation of LMGA Deep Creek Watershed Conservation Project.
If you have any questions or need additional information please contact myself or Camie Janikowski, SCD Manager.

Sincerely,
Bowman-Slope SCD Supervisors

Vern Brown, Chairman Jeff Brown, Brett Hendrickson, Cory Blaser, Tony Pierce

USDA United States Department of Agriculture | Forest Service | Dakota Prairie Grasslands

2000 Miriam Circle
Bismarck, ND 58501
701-989-7300
Fax: 701-989-7299

File Code: 2250
Date: August 13, 2020

Chad Erickson
President, Little Missouri Grazing Association
201 Inman Street
Amidon, ND 58620

Dear Mr. Erickson:

Please accept this letter documenting the Forest Service's commitment to a partnership with the Little Missouri Grazing Association in the Regional Conservation Partnership Program in order to implement various grazing management tools on National Forest System lands within the Deep Creek project area. The implementation of the Deep Creek Vegetation Management Project will begin the process of moving Grassland resources toward our Land & Resource Management Plan objectives providing for sustainable multiple use on the Dakota Prairie Grasslands.

The Forest Service is committed to providing range management and watershed technical assistance; botany, wildlife and archeological survey clearances; and engineering review. In addition, monitoring will play an integral part displaying the effectiveness of the applied management tools in meeting or moving towards resource objectives. The Forest Service has been and will continue to work cooperatively to collect monitoring data with the Little Missouri Grazing Association and other partners.

My staff and I look forward to advancing this partnership in the implementation of the Deep Creek Vegetation Management project. If you have questions or require further details, please feel free to contact Misty Hays at (701) 227-7824 or Nickole Dahl at (701) 227-7830.

Sincerely,

Jeff Tomac

JEFF TOMAC
Acting Grasslands Supervisor

Misty A Hays

MISTY A. HAYS
Medora District Ranger