Environmental Assessment Checklist

Project Name: Dillon DNRC Trust Land Bear Creek Riparian Restoration
Proposed Implementation Date: Spring 2026 -2031
Proponent: Dillon Unit, Central Land Office, Montana DNRC
County: Beaverhead

Type and Purpose of Action

Description of Proposed Action:

The Department of Natural Resources and Conservation (DNRC) has received a request from the Southwest Montana Sagebrush Partnership (SMSP) to perform riparian restoration on approximately 8 acres on state land in the Bear Creek area of Beaverhead County (T10S, R15W, 26), See **Attachment A** – Project Maps The overarching goal of the Bear Creek Riparian Restoration Project is to improve riparian condition in an 8-acre portion of the creek's floodplain where conifer encroachment and channel incision have led to decreased woody riparian cover and lowered water tables over the last 70+ years. The project proposes a combination of conifer removal and the installation of instream structures to address current stream degradation by elevating water tables, encouraging the expansion of riparian vegetation, and ultimately allowing beaver to naturally recolonize the project area. This project could begin as early as spring of 2026 and take up to five (5) years to complete. The DNRC along with SMSP, & MT FWP will be monitoring the project to see how the treatments are working and if improvements/changes need to be made.

Based on both aerial imagery and on-the-ground site assessments, conifer encroachment is currently the primary mechanism for riparian degradation within the proposed Bear Creek project area. As conifer have encroached into the Bear Creek floodplain, they have out-competed willows and other desirable riparian vegetation both by shading out adjacent vegetation and lowering the local groundwater table. Beaver are unable to persist in the project area due to both lack of ample food sources and limited deepwater habitat, leading to further lowering of the local groundwater table.

Objectives of the Project:

1. Removal of Douglas fir <10-inch DBH growing within the floodplain will be mechanically removed as the first step of project implementation. Willows and other riparian species are still present in the understory of the project area; therefore, we expect that planting and/or re-seeding efforts will be unnecessary for the re-growth of desirable riparian species.
2. On-site materials will be used to build BDAs, including willow, sod, and conifer limbs. Approximately 5-15 BDAs will be built throughout the project area in areas where overbank flow is achievable at moderate flows. When possible, BDAs will be built to plug

relic beaver dams which will maximize the water-storage capacity of these structures and provide deepwater habitat to encourage natural beaver recolonization from the colony just upstream of the project area.

3. Large wood that was cut during the conifer encroachment removal phase of project implementation will be placed in the channel throughout the project area to encourage increased instream habitat complexity and promote out-of-bank flow during runoff. Pieces of large wood will also be strategically placed in the floodplain to reduce ungulate and livestock browse on willows as well as disrupt trailing patterns in the floodplain.

Duration of Activities:
The initiation of project-related activities would begin approximately spring 2026. Treatments may continue up to November 2031 depending on individual project funding.

Project Development

SCOPING AND PUBLIC INVOLVEMENT:
A specific project scoping notice was sent to individuals adjacent to the proposed project and organizations likely to have an interest in the proposal and project area. Notices were sent out on February 11, 2026. The comment deadline was March 16, 2025.

DNRC Web Page
Beaverhead County Commissioners
Bar Double T Ranch Inc.
Bureau of Land Management
Emilia Grzesik, DNRC Forest Management Planner
Kelly Motichka, Ag & Grazing Bureau Chief
Patrick Rennie, DNRC Archeologist
Montana Sagegrouse Program
MT FWP Wildlife Biologist, Jesse Newby

SUMMARY OF COMMENTS RECEIVED:

How many: No comments received.

Concern: No concerns were raised during the comment period.

Result:

In accordance with the Montana Environmental Policy Act, public concerns about the project and potential environmental impacts must be considered and analyzed prior to making the decision of whether to allow permission for this proposal to be approved.

Accommodations were also made for the public to submit comments electronically using letters, phone calls and the email account michaela.kalinowski@mt.gov.

OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED: *(Conservation Easements, Army Corps of Engineers, road use permits, etc.)*

- Permission from the Montana Sage Grouse Habitat Conservation Program
- 124-Permit from Montana Fish, Wildlife & Parks
- NWP 27 Authorization from US Army Corps of Engineers

ALTERNATIVES CONSIDERED:

During development of this project two distinct alternatives were considered, which include the Proposed Action Alternative and the No Action Alternative.

Proposed Action Alternative – Under the Action Alternative, DNRC would allow the Southwest Montana Sagebrush Partnership (SMSP), to implement riparian restoration activities on State Trust Lands.

No Action Alternative – Under the No Action Alternative, the DNRC would not authorize the Southwest Montana Sagebrush Partnership (SMSP), to implement riparian restoration activities on State Trust Lands.

Impacts on the Physical Environment

Evaluation of the impacts on the No-Action and Action Alternatives including **direct, secondary, and cumulative** impacts on the Physical Environment.

VEGETATION:

Based on both aerial imagery and on-the-ground site assessments, conifer encroachment is currently the primary mechanism for riparian degradation within the proposed Bear Creek project area. Native conifer trees have encroached into the Bear Creek riparian over the last 70+ years and are now the dominant overstory species within the project area. If left untreated, conifer trees will continue to increase in density and extent throughout the Bear Creek floodplain, outcompeting desirable riparian species such as willow and lowering the local groundwater table.

Vegetation	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Noxious Weeds	**x**													
Rare Plants	**x**													
Vegetative community	**x**					**x**				**x**			**No**	**1.**
Action														
Noxious Weeds	**x**				**x**				**x**					
Rare Plants	**x**				**x**				**x**				**Yes**	**2.**

Vegetation	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Vegetative community		x				x				x			Yes	3.

Comments:

1. Under the No Action Alternative, conifer encroachment would continue into riparian dominated vegetation community types. As no activities would occur or be possible under this alternative, no mitigations would be possible to reduce this occurrence.

2. A data query was conducted by the Montana Natural Heritage Program (MNHP) for the project (March 23, 2026) to identify possible endangered, threatened, and sensitive plants in the proposed treatment areas. No sensitive plants were identified in the project area identified for treatment. Because the proposal will not allow motorized travel off designated roads, and the project requirements of hand crews cutting with chainsaws and loppers, the project will not create any measurable ground disturbance direct, indirect, and cumulative impacts to sensitive plants are not anticipated. See **Attachment B** – MNHP Report.

3. Under the Action Alternative beneficial effects to native plant communities in the area would be expected from conifer removal treatments.

SOIL DISTURBANCE AND PRODUCTIVITY:

Soil Disturbance and Productivity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Physical Disturbance (Compaction and Displacement)	x				x				x					2.
Erosion	x				x				x					2.
Nutrient Cycling	x				x				x					2.
Slope Stability	x				x				x					2.
Soil Productivity	x				x				x					2.
Action														
Physical Disturbance (Compaction and Displacement)	x				x				x					3.
Erosion	x				x				x					3.
Nutrient Cycling	x				x				x					3.
Slope Stability	x				x				x					3.
Soil Productivity	x				x				x					3.

Comments:

1. The NRCS soil survey identifies four different soil types present within the project area that would be treated under this proposal: (18F) Libeg-Nieman, very stony – Worock complex, 15 to

60 percent slope, (72B) Foolhen – Finn complex, 0 to 4 percent slopes, frequently flooded, (527Sa) Bata – Holloway – Garlet families, complex, gentle mountain slopes, and (9110B) Monaberg loam, 1 to 4 percent slopes. See **Attachment C** – Soil Report.

2. No Action Alternative, there wouldn't be any activities that would cause soil impacts or soil disturbance nor lower soil productivity.

3. Action Alternative would allow for the removal of conifers using hand crews, chainsaws, and hand loppers to cut down encroaching conifers and install BDAs as well as add structure to Bear Creek. Little or no soil disturbance would occur from these activities. There would be no mechanized equipment allowed, so compaction or soil rutting would not occur. No negative effects on soil productivity or soil disturbance are expected with this alternative.

WATER QUALITY AND QUANTITY:

Water Quality & Quantity	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Water Quality	**x**				**x**				**x**					**1.**
Water Quantity	**x**				**x**				**x**					**1.**
Action														
Water Quality	**x**				**x**					**x**				**2.**
Water Quantity	**x**				**x**					**x**				**2.**

Comments:
1. No Action Alternative, there would be no new impacts to water quality or quantity.

2. Bear Creek flows through the proposed project area. Conifer encroachment in the SMZ will be removed to improve deciduous plants in the riparian area and to improve stream flows in accordance with the Montana Stream Management Zone law. Given the project requirements, hand crews cutting with chainsaws and loppers will not create any measurable direct, indirect, and cumulative impacts to water quality, or introduce sedimentation to creeks or streams. Installation of the BDAs are expected to increase the groundwater table by maximizing water storage capacity and promote deep water habitat for beaver as well as promote out of bank flow during runoff.

FISHERIES:

Fisheries	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Sediment	**x**				**x**				**x**					**1.**

Fisheries	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Flow Regimes	x				x				x					1.
Woody Debris	x				x				x					1.
Stream Shading	x				x				x					1.
Stream Temperature	x				x				x					1.
Connectivity	x				x				x					1.
Populations	x				x				x					1.
Action														
Sediment	x				x				x					2.
Flow Regimes	x				x					x				2.
Woody Debris	x				x				x					2.
Stream Shading	x				x				x					2.
Stream Temperature	x				x				x					2.
Connectivity	x				x				x					2.
Populations	x				x				x					2.

Comments:

1. No Action Alternative, there would be no new impacts to the fisheries.

2. A data query was conducted of the Montana Natural Heritage Program (MNHP) for the project (March 23, 2026) to identify possible endangered, threatened, and sensitive fish species in the proposed treatment areas. West slope cutthroat trout was identified as present in Bear Creek. Given the project requirements, measurable direct, indirect, and cumulative negative impacts on fisheries would not be expected. The proposed activities may allow for more water flow in the streams due to the removal of conifers in the stream corridor. See **Attachment B** – MNHP Report

WILDLIFE:

A data query was conducted of the Montana Natural Heritage Program (MNHP) for the project (March 23, 2026) to identify species of occurrence in the proposed treatment area. Below were the identified species. See Attachment A – MNHP Report.

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Species of Concern														
Pygmy Rabbit *(Brachylagus idahoensis)* Habitat: dominated by sagebrush	x					x				x			**Yes**	**1.**
Wolverine *(Gulo gulo)* Habitat: Alpine tundra, and boreal	x				x				x				**Yes**	**2.**

Wildlife	Impact												Can Impact be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
and mountain forests														
Black-backed woodpecker *(Picoides arcticus)* Habitat: Mature to old burned or beetle-infested forest		**x**				**x**				**x**			**Yes**	**3.**
Ferruginous Hawk *(Buteo regalis)* Habitat: Sagebrush steppe		**x**				**x**				**x**			**Yes**	**3.**
Great Blue Heron *(Ardea herodia)* Habitat: wetlands, major rivers, & lakes		**x**				**x**				**x**			**Yes**	**3.**
Great Gray Owl *(Strix nebulosa)* Habitat: coniferous forest		**x**				**x**				**x**			**Yes**	**3.**
Greater Sage grouse (*Centrocercus urophasianus*) Habitat: sagebrush semi-desert	**x**					**x**				**x**			**Yes**	**4.**
Westslope Cutthroat Trout (*Oncorhynchus clarkia lewisi*) Habitat: Cold, gravely, pool and cover dominated streams	**x**					**x**				**x**			**Yes**	**5.**
Big Game Species														
Elk		**x**				**x**				**x**			**Yes**	**3.**
Whitetail		**x**				**x**				**x**			**Yes**	**3.**
Mule Deer		**x**				**x**				**x**			**Yes**	**3.**
Other		**x**				**x**				**x**			**Yes**	**3.**

Comments:

1. Pygmy Rabbit – The project area is confirmed area of occupancy for the species. The pygmy rabbit typically inhabits shrub, sagebrush steppe grasslands on alluvial fans and high mountain valleys. Big sagebrush is the primary food source, but grass and forbs are eaten in mid- to late summer. Habitat can be severely impacted by conifer encroachment. The positive impact of removing conifers from the sagebrush-rangeland communities outweigh any short-term

disturbance during the project's workflow. There are no long term or cumulative negative impacts expected from the action alternative.

2. Wolverine – The project area falls within the distribution of wolverines in Montana. However, high elevation peaks and basins that possess late persistent snowpack in spring are not present in the project area. Given that preferred denning habitat for wolverines would not be treated under the proposed action, no direct, indirect, or cumulative effects to wolverines would be anticipated.

3. Other Terrestrial and Avian Wildlife Species – Vegetation communities on the project area likely provide suitable habitat for numerous other terrestrial and avian wildlife species. Such species would likely include elk, deer, forest carnivores, small mammals, prairie, and forest associated neotropical migrant birds, raptors, black bears, etc. Treatments could remove vegetative cover usable by some species, and during treatments, (motorized disturbance on existing roads and chainsaw noise) associated with conifer removal could disturb and displace wildlife in the area for up to two months. Generally, species associated with native rangeland and sagebrush habitats would benefit, whereas species more associated with coniferous forest for meeting life requisites would not benefit. Given the types of proposed treatments, the acreage that would be treated, and the duration of activities could occur (approximately five years starting spring of 2026), minor adverse direct, indirect and cumulative effects to resident species would be expected.

Linkage, Corridors, and Habitat Connectivity – The project area is focused on edge habitat situated along a forest-grassland ecotone. As such, forest cover is patchy and likely occurred in a patchy fashion under historical conditions. The project area does not occur within any known linkage zones or corridors important for maintaining connectivity of populations or migration routes. However, the potential for both short- and long-term fragmentation and loss of rangeland and sagebrush habitat would be reduced, providing benefits for associated species such as sage grouse.

4. Greater Sage Grouse – All conifer encroachment work in general sage grouse habitat was identified as having no applicable mitigation measures because the project is beyond four miles of any active sage grouse lek, construction involves the use of hand tools, and access to the sites will be on foot or by existing roads. This meets the requirements of the Montana Sage Grouse Habitat Conservation Program. The Montana Sage Grouse Habitat Conservation Program was consulted on this project and the project was approved on March 6, 2026.

5. Westslope Cutthroat Trout – The project areas may contain Westslope Cutthroat Trout habitat. The proposed activities would have no negative effects on the species but may allow for more water flow in the streams due to the removal of conifers in the stream corridor.

AIR QUALITY:

Air Quality	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Smoke	**x**				**x**				**x**					**1.**
Dust	**x**				**x**				**x**					**1.**
Action														
Smoke		**x**			**x**				**x**					**2.**
Dust		**x**			**x**				**x**					**2.**

Comments:
1. No Action Alternative, there would be no impact on air quality.

2. Action Alternative, there would be limited dust impact due to vehicle travel to and from the project areas and the equipment working. The impact would be low on air quality and pose no risks.

OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA: *List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.*

No other known environmental documents or state actions are being examined within the project area.

ARCHAEOLOGICAL SITES / AESTHETICS / DEMANDS ON ENVIRONMENTAL RESOURCES:

Cultural resources include archaeological sites, historic sites, architectural properties, traditional cultural properties (TCPs), districts, landscapes, structures, features, or objects resulting from human activity. Cultural resources are nonrenewable and, for the region, reflect either pre-European contact and date from hundreds to thousands of years old, or historic and date from A.D. 1805 (for Montana) to approximately A.D. 1966. They are typically recognized as tangible manifestations of human behavior that are at least 50 years old.

Paleontological resources are fossilized plants and animal remains that are rare and have scientific research value. Nonrenewable paleontological and cultural resources provide invaluable information about the behavior of past plants, animals, and human populations and their environments.

A Class I (literature review) level review was conducted by the DNRC staff archaeologist. This entailed inspection the DNRC's sites/site leads database, land use records, General Land Office maps, and control cards for potential cultural resources in the proposed project area. That series of searches indicated that no cultural or paleontological resources have been identified in the project area of potential effect. No additional archaeological investigative work is

recommended. Proposed stream rehabilitation activities are expected to have *No Effect* to *Antiquities*.

COMMENTS:

1. No Action Alternative, cultural and palaeontologic resources within the project APEs will persist indefinitely in the environment.

2. Action Alternative, the proposed action consists of cutting Douglas fir and juniper in localities where immature trees are typically spaced several feet or yards apart. This will entail one or more individual's using chainsaws or loppers and walking from tree to tree to cut them down to be used as BDAs and add structure to the stream. This form of treatment has no potential to impact any cultural or palaeontologic resource physically or visually.

   Because no cultural or palaeontologic site has been identified on state land within the APEs, proposed conifer encroachment treatments will not impact these resources.

Impacts on the Human Population

Evaluation of the impacts on the proposed action including <u>direct, secondary, and cumulative</u> impacts on the Human Population.

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
No-Action														
Health and Human Safety	**x**				**x**				**x**					
Industrial, Commercial and Agricultural Activities and Production	**x**				**x**				**x**					
Quantity and Distribution of Employment	**x**				**x**				**x**					
Local Tax Base and Tax Revenues	**x**				**x**				**x**					
Demand for Government Services	**x**				**x**				**x**					
Access To and Quality of Recreational and Wilderness Activities	**x**				**x**				**x**					
Density and Distribution of	**x**				**x**				**x**					

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
population and housing														
Social Structures and Mores	**x**				**x**				**x**					
Cultural Uniqueness and Diversity	**x**				**x**				**x**					
Action														
Health and Human Safety		**x**				**x**				**x**			**Yes**	**1.**
Industrial, Commercial and Agricultural Activities and Production	**x**				**x**				**x**					**2.**
Quantity and Distribution of Employment	**x**				**x**				**x**					
Local Tax Base and Tax Revenues	**x**				**x**				**x**					
Demand for Government Services	**x**				**x**				**x**					
Access To and Quality of Recreational and Wilderness Activities	**x**				**x**				**x**					**3.**
Density and Distribution of population and housing	**x**				**x**				**x**					
Social Structures and Mores	**x**				**x**				**x**					**4.**
Cultural Uniqueness and Diversity	**x**				**x**				**x**					

Comments:

1. Proposed tree slashing activities would require adequate safety measures to be in place to ensure the safety of workers. Safety requirements complying with OSHA standards and federal and state safety regulations would be required for all sawing operations.

2. The proposed treatments that would be conducted using grant funding would not be expected to alter any existing traditional agricultural or ranching uses on the project area or surrounding lands.

3. Project implementation would result in minor, short-term disturbances that could temporarily affect access and the visual character of the area; however, these effects would be localized and diminish quickly over time. As conditions recover, improvements to riparian function, water storage, and habitat complexity would enhance the natural setting, supporting higher-quality recreation experiences such as wildlife viewing and general enjoyment of the landscape. Overall, changes would be subtle and short-lived, with long-term benefits to the scenic and ecological conditions that contribute to recreation quality.

4. The proposed treatments that would be conducted using grant funding would not be expected to disturb or alter any native or traditional lifestyles or communities.

Does the proposed action involve potential risks or adverse effects that are uncertain but extremely harmful if they were to occur?

The proposed actions associated with this project will not involve potential risks or any adverse effects that are uncertain or extremely harmful if they were to occur.

Does the proposed action have impacts that are individually minor, but cumulatively significant or potentially significant?

The proposed actions associated with this project will not have any cumulative effects or potentially significant effects on the environment.

Environmental Assessment Checklist Prepared By:

Name: Michaela Kalinowski
Title: Dillon Unit Fuels Forester
Date: 03/23/2026

Finding

Alternative Selected

Proposed Action Alternative – Under the Action Alternative, DNRC would allow the Southwest Montana Sagebrush Partnership (SMSP), to implement riparian restoration activities on State Trust Lands.

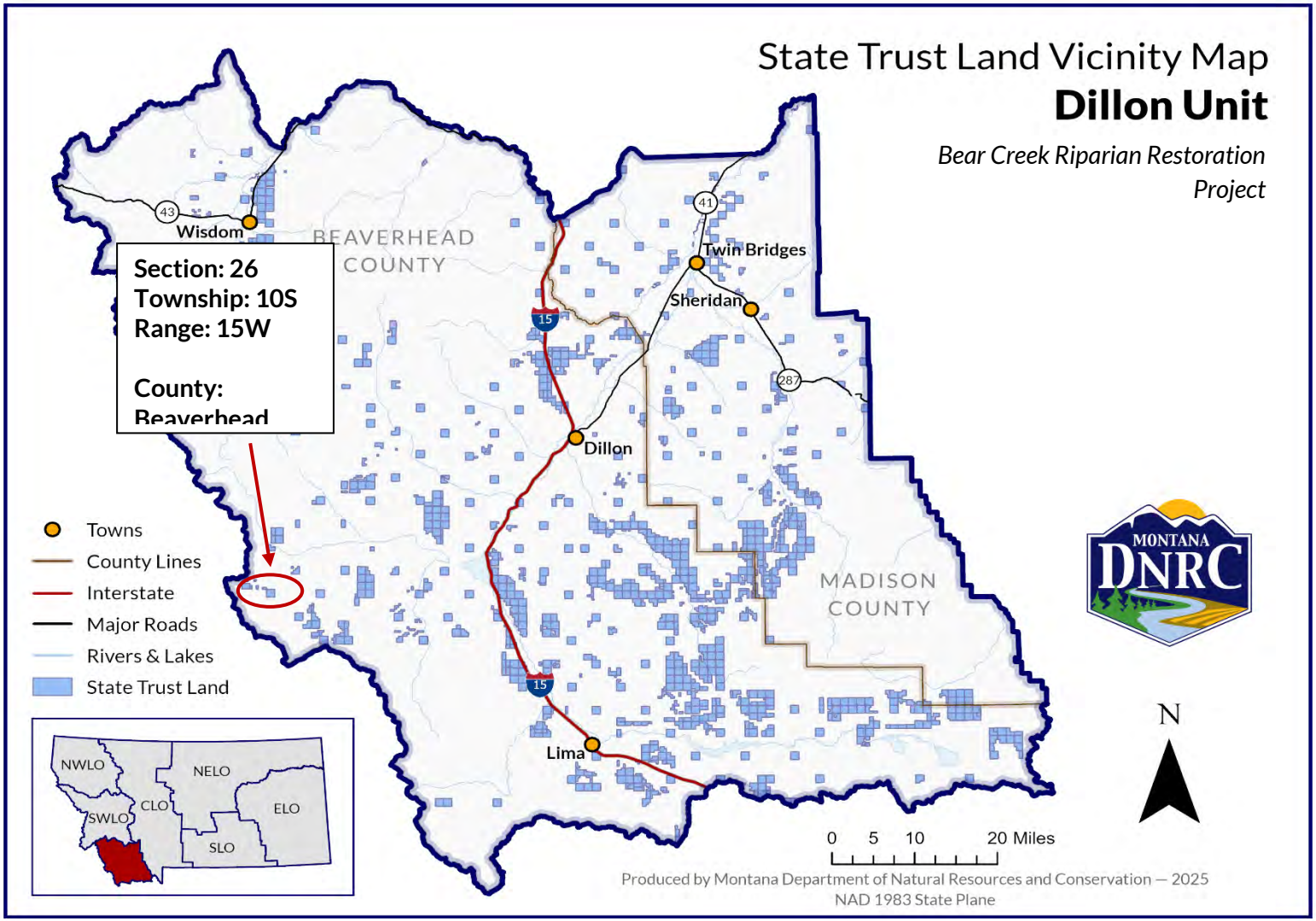
The potential positive impacts of this project are very high, with very little negative impacts expected because activities are limited in scope, rely on existing site conditions, and use natural, on-site materials. Removal of small-diameter Douglas fir within the floodplain would cause only short-term disturbance while allowing existing willow and riparian vegetation to naturally regenerate without the need for planting. Installation of a limited number of beaver dam analogs (BDAs), particularly at relic dam sites, would enhance water storage, improve habitat, and encourage natural beaver recolonization, while appearing consistent with natural features on the landscape. Placement of large wood generated during treatment would further increase habitat complexity, promote overbank flow, and protect regenerating vegetation. Overall, these actions would produce localized, temporary effects while providing long-term improvements to riparian function, habitat quality, and ecosystem resilience. This work will be paid for through grant funding and be administered through the DNRC and the SMSP.

Need for Further Environmental Analysis

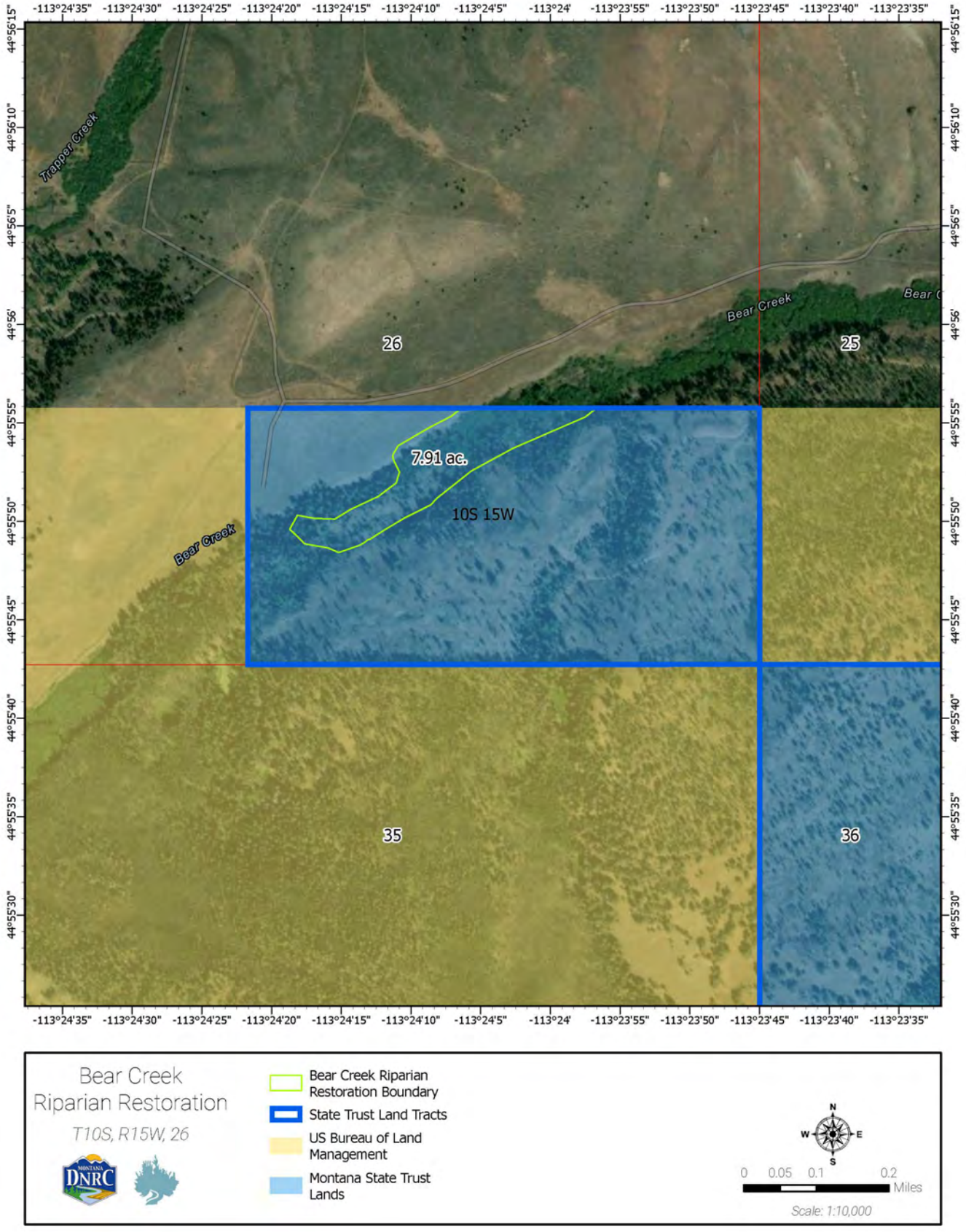
☐	EIS	☐	More Detailed EA	X	No Further Analysis

Environmental Assessment Checklist Approved By:
Name: Scott MacDonald
Title: Acting Dillon Unit Manager
Date: 03/24/26
Signature:

Attachment A – Project Maps



Attachment A – Project Maps



Attachment B – MNHP Report

MONTANA STATE LIBRARY
NATURAL HERITAGE PROGRAM
A program of the Montana State Library's Natural Resource Information System.

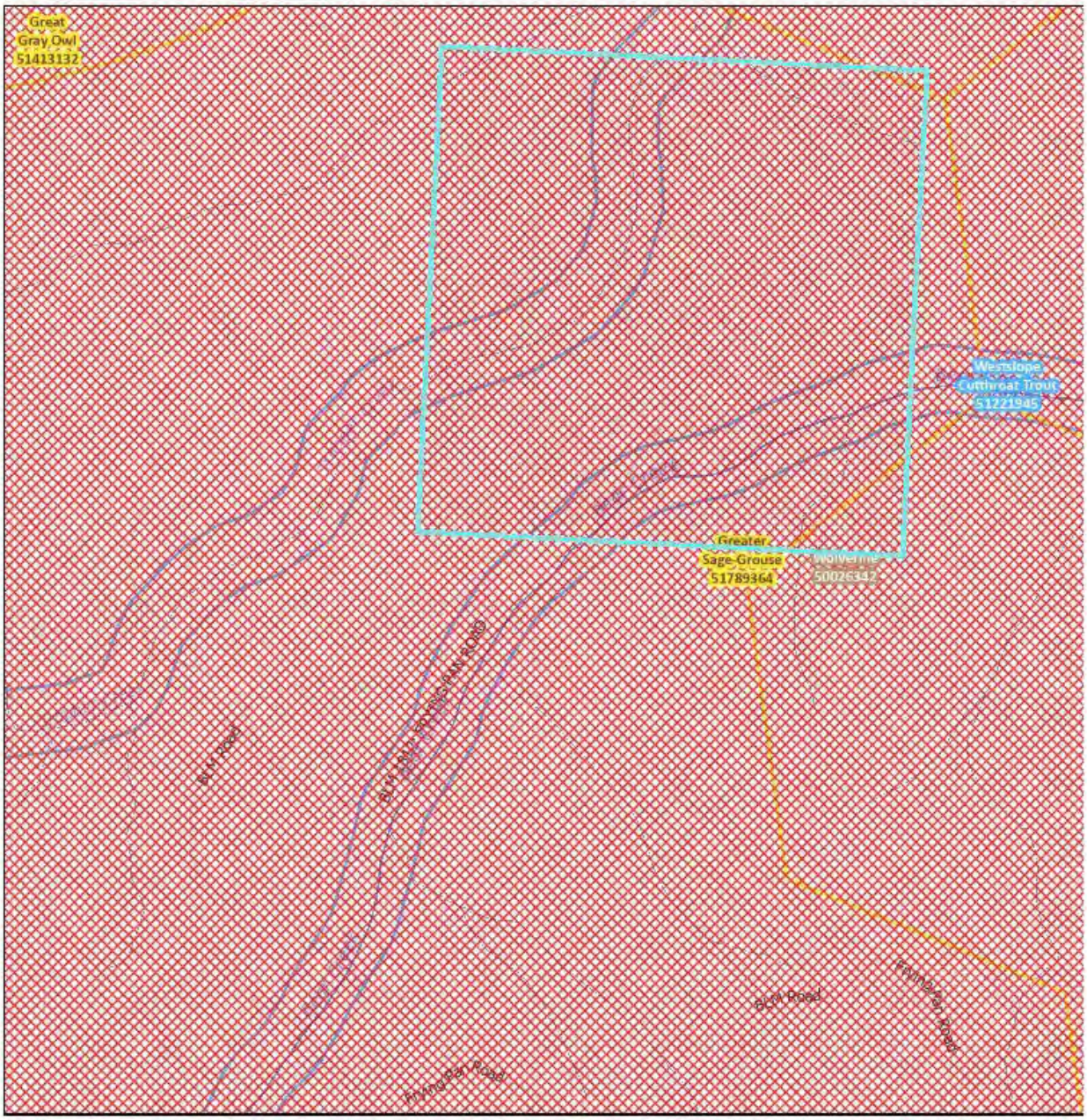
Latitude	Longitude
44.90818	-113.35307
44.94809	-113.45193

Montana SOC Occurrences Report

Report generated 3/23/2026 9:17:45 AM

SOC Occurrences with MT Status = Species of Concern, Special Status, Potential SOC or USFWS = LE: Listed endangered, LT: Listed threatened or BLM = Endangered, Threatened, Sensitive

Attachment B – MNHP Report



Species List | plus Occurrences | plus Obs (may take a while)

Mammals - Pygmy Rabbit *(Sylvilagus idahoensis)*	SO Count: 29	Obs Count: 29	Earliest Obs: 2004	Recent Obs: 2005
Mammals - Wolverine *(Gulo gulo)*	SO Count: 1	Obs Count: 30	Earliest Obs: 1959	Recent Obs: 2022
Birds - Black-backed Woodpecker *(Picoides arcticus)*	SO Count: 1	Obs Count: 1	Earliest Obs: 2018	Recent Obs: 2018
Birds - Ferruginous Hawk *(Buteo regalis)*	SO Count: 1	Obs Count: 1	Earliest Obs: 1985	Recent Obs: 1985
Birds - Great Blue Heron *(Ardea herodias)*	SO Count: 1	Obs Count: 1	Earliest Obs: 1996	Recent Obs: 1996
Birds - Great Gray Owl *(Strix nebulosa)*	SO Count: 1	Obs Count: 1	Earliest Obs: 2015	Recent Obs: 2015
Birds - Greater Sage-Grouse *(Centrocercus urophasianus)*	SO Count: 5	Obs Count: 37	Earliest Obs: 1977	Recent Obs: 2024

https://mtnhp.org/MapViewer/SOReport.aspx[3/23/2026 9:19:04 AM]

Attachment B – MNHP Report

Fish - Westslope Cutthroat Trout *(Oncorhynchus lewisi)*

SO Count: 1 Obs Count: 712 Earliest Obs: 1953 Recent Obs: 2022

Citation for this report:
Montana SOC Occurrences Report
SOC Occurrences with MT Status = Species of Concern, Special Status, Potential SOC or USFWS = LE: Listed endangered, LT: Listed threatened or BLM = Endangered, Threatened, Sensitive
Within Lat/Long: (44.90818,-113.35307) to (44.94809,-113.45193)
Natural Heritage Map Viewer. Montana Natural Heritage Program.
Retrieved on March 23, 2026, from https://mtnhp.org/MapViewer/SOReport.aspx

Attachment C – Soil Report

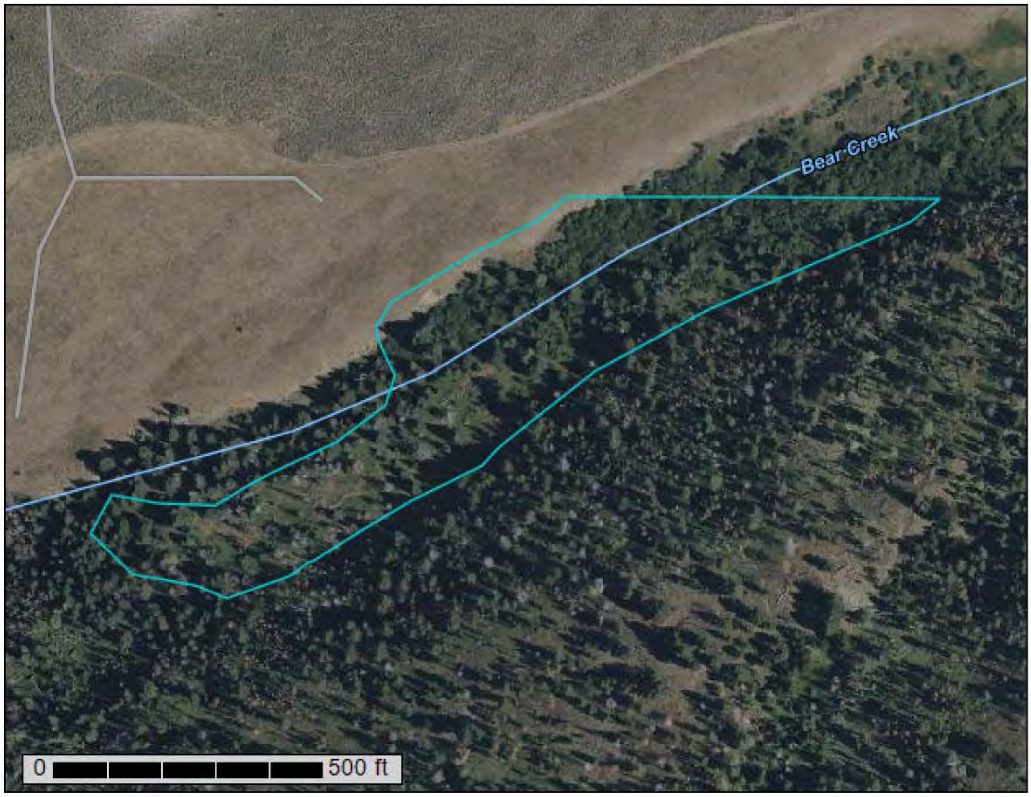
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Horse Prairie-South Valley Area - Part of Beaverhead County, Montana



March 23, 2026

Attachment C – Soil Report

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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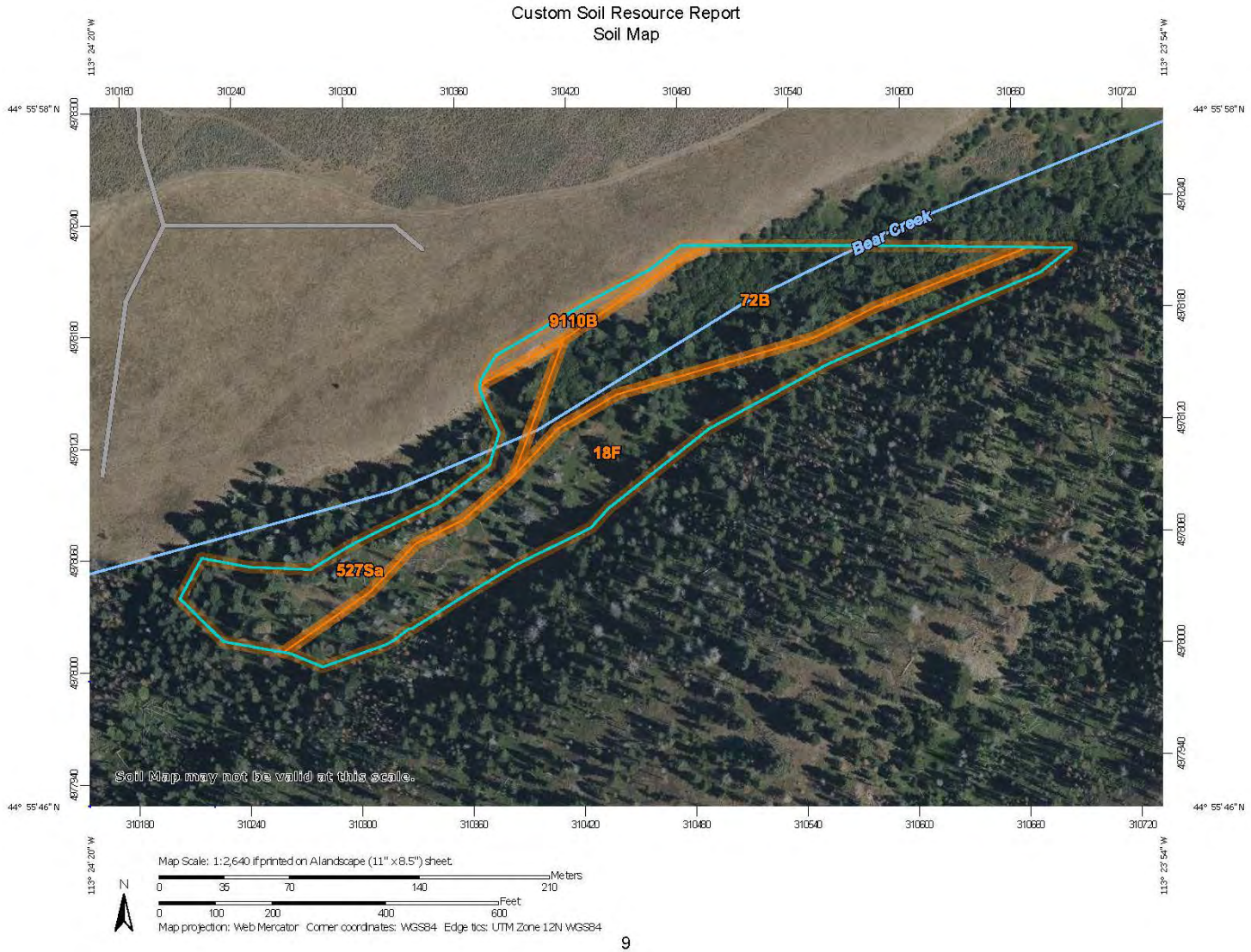

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Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Horse Prairie-South Valley Area - Part of Beaverhead County, Montana
Survey Area Data: Version 21, Aug 30, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 23, 2022—Aug 7, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
18F	Libeg-Nieman, very stony-Worock complex, 15 to 60 percent slopes	3.3	42.1%
72B	Foolhen-Finn complex, 0 to 4 percent slopes, frequently flooded	2.7	34.1%
527Se	Bata-Holloway-Garlet families, complex, gentle mountain slopes	1.6	20.4%
9110B	Monaberg loam, 1 to 4 percent slopes	0.3	3.4%
Totals for Area of Interest		**7.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

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was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

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Horse Prairie-South Valley Area - Part of Beaverhead County, Montana

18F—Libeg-Nieman, very stony-Worock complex, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: 20qft
Landscape: Mountains
Elevation: 6,500 to 7,500 feet
Mean annual precipitation: 18 to 24 inches
Mean annual air temperature: 34 to 39 degrees F
Frost-free period: 50 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Libeg and similar soils: 45 percent
Nieman, very stony, and similar soils: 20 percent
Worock and similar soils: 15 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Libeg

Setting

Landscape: Mountains
Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium

Typical profile

A - 0 to 6 inches: gravelly loam
Bt - 6 to 31 inches: very cobbly sandy clay loam
BC - 31 to 60 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R043BP819MT - Upland Sagebrush Shrubland Group
Hydric soil rating: No

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Description of Nieman, Very Stony

Setting

Landscape: Mountains
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium over residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 4 inches: cobbly loam
Bt1 - 4 to 8 inches: very cobbly clay loam
Bt2 - 8 to 18 inches: extremely cobbly clay loam
R - 18 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R043BP811MT - Shallow Sagebrush Shrubland Group
Hydric soil rating: No

Description of Worock

Setting

Landscape: Mountains
Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 7 inches: gravelly loam
E/Bt - 7 to 18 inches: gravelly loam
Bt - 18 to 28 inches: very gravelly clay loam
BC - 28 to 60 inches: very gravelly sandy clay loam

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

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Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F043BP910MT - Upland Cool Woodland Group
Other vegetative classification: Douglas-fir/pinegrass (PK320), subalpine fir/ twinflower (PK660)
Hydric soil rating: No

Minor Components

Rock outcrop, metamorphic

Percent of map unit: 10 percent
Hydric soil rating: Unranked

Redchief, extremely stony

Percent of map unit: 5 percent
Landscape: Mountains
Landform: Mountain slopes
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R043BP820MT - Upland Shrubland Group
Hydric soil rating: No

Houlihan

Percent of map unit: 3 percent
Landscape: Mountains
Landform: Swales on mountain slopes
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R043BP818MT - Upland Grassland Group
Hydric soil rating: No

Rubble land

Percent of map unit: 2 percent
Hydric soil rating: Unranked

72B—Foolhen-Finn complex, 0 to 4 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 20qfv
Landscape: Intermontane basins
Elevation: 6,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches

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Mean annual air temperature: 34 to 39 degrees F
Frost-free period: 50 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Foolhen, frequently flooded, and similar soils: 45 percent
Finn, frequently flooded, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Foolhen, Frequently Flooded

Setting

Landscape: Intermontane basins
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Oi - 0 to 3 inches: peat
A - 3 to 10 inches: loam
Bw - 10 to 19 inches: sandy clay loam
Bg - 19 to 23 inches: silt loam
Cg1 - 23 to 34 inches: sandy clay loam
Cg2 - 34 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R044BP817MT - Subirrigated Shrubland
Hydric soil rating: Yes

Description of Finn, Frequently Flooded

Setting

Landscape: Intermontane basins
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium

Typical profile

Oi - 0 to 3 inches: peat
A1 - 3 to 7 inches: silt loam

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A2 - 7 to 15 inches: silt loam
Bw1 - 15 to 27 inches: very gravelly loam
Bw2 - 27 to 35 inches: extremely gravelly sandy clay loam
Cg - 35 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R044BP817MT - Subirrigated Shrubland
Hydric soil rating: Yes

Minor Components

Cowcamp

Percent of map unit: 5 percent
Landscape: Intermontane basins
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BP819MT - Upland Sagebrush Shrubland
Hydric soil rating: No

Beaverslide

Percent of map unit: 5 percent
Landscape: Intermontane basins
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BP818MT - Upland Grassland
Hydric soil rating: No

Bighole

Percent of map unit: 4 percent
Landscape: Intermontane basins
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BP819MT - Upland Sagebrush Shrubland
Hydric soil rating: No

Water

Percent of map unit: 1 percent
Hydric soil rating: Unranked

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527Sa—Bata-Holloway-Garlet families, complex, gentle mountain slopes

Map Unit Setting

National map unit symbol: 504g
Landscape: Mountains
Elevation: 6,710 to 9,020 feet
Mean annual precipitation: 23 to 41 inches
Mean annual air temperature: 36 to 39 degrees F
Frost-free period: 30 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Bata and similar soils: 40 percent
Holloway and similar soils: 30 percent
Garlet and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bata

Setting

Landscape: Mountains
Landform: Gentle mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over colluvium derived from quartzite

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material
E - 3 to 4 inches: gravelly ashy silt loam
Bw - 4 to 12 inches: gravelly ashy silt loam
2E/Bt - 12 to 23 inches: very gravelly sandy loam
2Bt - 23 to 60 inches: very gravelly sandy clay loam

Properties and qualities

Slope: 0 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C

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Ecological site: F043BP909MT - Upland Cold Woodland Group
Other vegetative classification: subalpine fir/grouse whortleberry (PK730), subalpine fir/pinegrass (PK750), subalpine fir/heartleaf arnica (PK780), subalpine fir/elk sedge (PK790)
Hydric soil rating: No

Description of Holloway

Setting
Landscape: Mountains
Landform: Gentle mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over colluvium derived from quartzite

Typical profile
Oi - 0 to 3 inches: slightly decomposed plant material
E - 3 to 4 inches: gravelly ashy silt loam
Bw - 4 to 13 inches: gravelly ashy silt loam
2E - 13 to 20 inches: extremely gravelly loam
2E&Bt - 20 to 55 inches: extremely gravelly loam
2C - 55 to 60 inches: extremely gravelly loam

Properties and qualities
Slope: 0 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F043BP909MT - Upland Cold Woodland Group
Other vegetative classification: subalpine fir/grouse whortleberry (PK730), subalpine fir/pinegrass (PK750), subalpine fir/heartleaf arnica (PK780), subalpine fir/elk sedge (PK790)
Hydric soil rating: No

Description of Garlet

Setting
Landscape: Mountains
Landform: Gentle mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from quartzite

Typical profile
Oi - 0 to 3 inches: slightly decomposed plant material
E - 3 to 7 inches: gravelly loam
E/B - 7 to 22 inches: very channery loam

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B/E - 22 to 49 inches: very flaggy sandy loam
BC - 49 to 60 inches: very flaggy sandy loam

Properties and qualities

Slope: 0 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: F043BP909MT - Upland Cold Woodland Group
Other vegetative classification: subalpine fir/grouse whortleberry (PK730), subalpine fir/pinegrass (PK750), subalpine fir/heartleaf arnica (PK780), subalpine fir/elk sedge (PK790)
Hydric soil rating: No

Minor Components

Como

Percent of map unit: 10 percent
Landscape: Mountains
Landform: Gentle mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: subalpine fir/grouse whortleberry (PK730), subalpine fir/pinegrass (PK750), subalpine fir/heartleaf arnica (PK780), subalpine fir/elk sedge (PK790)
Hydric soil rating: No

9110B—Monaberg loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 20g5f
Landscape: Mountains
Elevation: 6,500 to 7,500 feet
Mean annual precipitation: 17 to 22 inches
Mean annual air temperature: 34 to 39 degrees F
Frost-free period: 50 to 70 days
Farmland classification: Not prime farmland

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Map Unit Composition

Monaberg and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit

Description of Monaberg

Setting

Landscape: Mountains
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 15 inches: loam
Bt - 15 to 34 inches: gravelly sandy clay loam
BC - 34 to 60 inches: gravelly loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R043BP819MT - Upland Sagebrush Shrubland Group
Hydric soil rating: No

Minor Components

Hairpin

Percent of map unit: 10 percent
Landscape: Mountains
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R043BP818MT - Upland Grassland Group
Hydric soil rating: No

Libeg

Percent of map unit: 5 percent
Landscape: Mountains
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R043BP819MT - Upland Sagebrush Shrubland Group
Hydric soil rating: No

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Houlihan

Percent of map unit: 5 percent
Landscape: Mountains
Landform: Swales on fan remnants
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R043BP820MT - Upland Shrubland Group
Hydric soil rating: No

Finn

Percent of map unit: 5 percent
Landscape: Mountains
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R043BP815MT - Subirrigated Grassland Group
Hydric soil rating: Yes

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End of Documentation