

CHECKLIST ENVIRONMENTAL ASSESSMENT

| | |
|--------------------------------------|---|
| Project Name: | Frontier Town Microwave Hazard Tree Removal |
| Proposed Implementation Date: | Upon Signature |
| Proponent: | USDA Forest Service - Helena Ranger District |
| Location: | Section 36 Township 10 North Range 6 West (see map) |
| County: | Lewis and Clark |

I. TYPE AND PURPOSE OF ACTION

The USDA Forest Service - Helena Ranger District is applying for an Alternative Practice (AP) to harvest hazard trees on Forest Service land located along power lines near the Frontier Town on MacDonald Pass. Hazard trees are defined as trees that are leaning due to windthrow or mechanical means, or may present a falling or other hazard to the power lines. The project would be expected to intermittently impact approximately 100 feet of Class 3 stream bank. This area has been significantly affected by mountain pine beetle in the lodgepole pine stands. This Alternative Practice would facilitate the removal of hazard trees that have become a safety hazard near utility lines.

According to MCA 77-5-301 through 307, DNRC is authorized to administer and enforce the provisions of the SMZ Law. This Law was developed to protect the public interest of water quality and quantity within forested areas; provide for standards, oversights and penalties to ensure forest practices conserve the integrity of SMZ's; provide guidelines for wildlife management within SMZ's; and allow operators necessary flexibility to use practices appropriate to site-specific conditions in the SMZ. ARM 36.11.301 through 313 further specify the design of SMZ boundaries, allowable activities and prohibitions within the SMZ, penalties and other related provisions.

According to MCA 77-5-304 and ARM 36.11.310, DNRC may approve alternative practices that are different from practices required by the SMZ Law only if such practices would be otherwise lawful and continue to conserve or not significantly diminish the integrity and function of the SMZ. The proximity of hazard trees to utility lines has created significant safety issues that may require treatments outside of the allowances of the SMZ law. Treatment would be limited to operation of a feller-buncher inside the 50 foot SMZ, but no closer than 25 feet to the ordinary high water mark (OHWM) unless equipment is operating while on an existing road. This treatment would be conducted on slopes less than 15% and would allow removal of lodgepole and ponderosa pine, Douglas-fir, and/or Engelmann spruce to below minimum retention standards for short stretches as identified under Rules 4 and 5 in the *Montana Guide to the Streamside Zone Law and Rules 2006* (ARM 36.11.310-313). Additional mitigations and stipulations pertinent to this request will include:

- Only operation of feller buncher type machine inside the 50 foot SMZ would be allowed, no closer than 25 feet to the ordinary high water mark (OHWM). Operation would occur in a straight in and straight out manner. A cable choker may be used to retrieve logs that the feller buncher cannot remove from the SMZ.
- Trees and slash would be placed outside of the 50 foot buffer, or in an existing roadway for skidding.
- All piling of woody material for grinding would occur outside of the 50 foot buffer.
- Operation would only occur during periods when soil disturbance can be minimized under conditions of frozen ground to four inches and/or snow covered to eight inches.
- No trees shall be felled in or across the stream. Any debris from falling or skidding operations that enters the stream must be removed immediately.

- Mitigation measures would include grass seeding and slash filter windrows placed on disturbed areas to prevent run-off and sediment from reaching stream segments.
- Small, healthy trees and all brush species, would be retained and protected to the greatest extent possible.
- This AP only allows for equipment operation on slopes less than 15%.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project.

Montana DNRC (Devin Healy), Helena Ranger District (Zev Hunting)

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

DNRC is not aware of other agencies besides the proponent with jurisdiction. DNRC is not aware of other permits needed to complete this project. There are no planned alterations to the existing shape and form of any stream, banks or tributaries a 124 permit is not needed.

3. ALTERNATIVES CONSIDERED:

Alternative A –No Action: The No Action alternative would not operate machinery inside the fifty foot buffer. Hazard trees would likely be felled and likely removed. Retention requirements would be observed

Alternative B – Action: Please see *Type and Purpose of Action* for a full description of this alternative.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" if no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify any cumulative impacts to soils.

Alternative A - No Action: No equipment operation would be allowed inside the 50 foot SMZ. Minimum retention standards would be recognized. Trees would be cable skidded out of the SMZ. Harvest equipment would operate on soils described as "poorly suited" to timber harvest equipment operation outside of the 50 foot SMZ buffer.

Alternative B – Action: Equipment operation would occur inside the SMZ, and it would be limited to areas where slope is less than 15%. Soils in the SMZ that are described as "poorly suited" for timber harvest Equipment Operability in the Web Soil Survey (see attached soil survey). Mitigation measures would include operating season restrictions that require snow covered to eight inches and/or frozen to six inches. Equipment would be required to operate in a straight in and out manner. In addition, grass-seeding and installation of erosion control measures such as a slash-filter windrow on any disturbed area upon completion of activity would be required. Minimal direct, indirect or cumulative impacts to soil stability and compaction are anticipated due to the operation restrictions and mitigation measures.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify cumulative effects to water resources.

Alternative A - No Action: No equipment operation would be allowed inside the 50 foot SMZ. Minimum retention standards would be recognized. Hand-felling operations may introduce low levels of sediment delivery to adjacent waterbodies. Slash and down woody debris could end up in the stream course.

Alternative B – Action: The regulated operation of harvest equipment within the first 25 feet of the SMZ (50'-25' from OHWM) may introduce very low levels of sediment delivery to the stream. The 25 foot equipment exclusion zone, with mitigation measures properly installed, would be expected to provide suitable filtration for any displaced soils or increased runoff due to compacted soils in the 25 to 50 foot AP zone. Increases in sedimentation would be expected to be very minimal and temporary due to operations only occurring on slopes less than 15% and application of mitigation measures. Mitigation measures include imposing seasonal operating restrictions that require ground to be snow covered to eight inches and/or frozen to six inches; and requiring grass seeding and installation of erosion control measures such as a slash-filter windrow on any disturbed area upon completion of operations. DNRC may monitor AP sites to verify effectiveness. Minimal direct, indirect, and cumulative impacts to water quality and quantity are expected due to operation restrictions and mitigation measures. Impacts would also be localized due to the short length stream the Action Alternative applies to. Minimal direct, indirect or cumulative impacts to water quality are anticipated due to the operation restrictions and mitigation measures.

6. AIR QUALITY:

What pollutants or particulate would be produced? Identify air quality regulations or zones (e.g. Class I air shed) the project would influence. Identify cumulative effects to air quality.

The project is located in Montana State Airshed 6 which encompasses all of Lewis & Clark County. Under either the Action Alternative or the No Action Alternative the USFS plans to burn slash piles.

Alternative A – Minor Temporary impacts due to increased particulate matter from burning slash piles. USFS is part of the Montana Idaho Airshed Group that requires burning be done when dispersion conditions provide for sufficient ventilation.

Alternative B – Minor Temporary impacts due to increased particulate matter from burning slash piles. USFS is part of the Montana Idaho Airshed Group that requires burning be done when dispersion conditions provide for sufficient ventilation. No direct, indirect, or cumulative impacts are anticipated to occur.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify cumulative effects to vegetation.

Alternative A - No Action: : Vegetative communities would be affected to the extent that Douglas-fir, lodgepole pine, Engelmann spruce would not be reduced to below minimum retention standards as outlined in Rule 5 of the *Montana Guide to the Streamside Management Zone Law and Rules* handbook.

Alternative B – Action: Vegetative communities would be affected to the extent Douglas-fir, lodgepole pine, Engelmann spruce would be reduced to below minimum retention standards as outlined in Rule 5 of the *Montana Guide to the Streamside Management Zone Law and Rules* handbook. Other tree species unless identified as hazardous would be retained where present and understory vegetation would be protected to the greatest extent possible. Impacts would also be localized due to the short length stream the Action Alternative applies to.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify cumulative effects to fish and wildlife.

Alternative A – No Action: Due to the areas being heavily used for recreation and proximity to improvements, the suitability of the proposed sites would continue to be marginal for terrestrial and avian habitat. (See attached list for *Species of Concern*)

Alternative B – Action: Operating restrictions and mitigation measures would minimize sedimentation impacts to fish habitat. In areas of reduced below retention tree requirements, stream shading would be minimally reduced and peak seasonal stream temperatures may see an increase in July and August. Submerchantable trees and brush would be retained and protected to the greatest extent possible. Minimal direct, indirect or cumulative impacts to aesthetics are anticipated due to the length of the stream segment, location of stream segment, operation restrictions and mitigation measures. (See attached list for *Species of Concern*)

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify cumulative effects to these species and their habitat.

Alternative A – No Action: A query of the Montana Natural Heritage Program identifies the area as being possible habitat for wolverine, Hoary Bat, Canada Lynx, Fisher, Little Brown Myotis, and Westslope Cutthroat Trout. Due to the proximity of heavy recreational activities and access to cabin sites, this area is not ideal habitat for wolverine. Minimum retention standards would be adhered to as well as equipment restrictions. (See attached list for *Species of Concern*)

Alternative B – Action: If a sighting of any of the listed species of concern (or evidence such as nests, dens, etc.) occurs, operations would be halted, or not allowed, until further assessment can take place. (See attached list for *Species of Concern*)

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine effects to historical, archaeological or paleontological resources.

A systematic inventory of such resources has not occurred. Because the project is not located on state land, the DNRC has no jurisdiction to require landholders to conduct professional level inventories to identify, or develop treatment plans for, privately owned National Register eligible properties.

11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify cumulative effects to aesthetics.

Alternative A – No Action: Minimum retention standards and equipment restrictions would be adhered to.

Alternative B – Action: Potential impacts may be perceived as adverse by recreationists, landowners and travelers. The removal hazard trees could look unsightly in the short term, but would encourage regeneration. This regeneration would eventually soften and replace aesthetic quality damaged by mountain pine beetle infestation. Impacts would also be localized due to the short length stream the Action Alternative applies to. Minimal direct, indirect or cumulative impacts to aesthetics are anticipated due to the length of the stream segment, location of stream segment, operation restrictions and mitigation measures.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify cumulative effects to environmental resources.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

13. 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.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B Action: No direct, indirect, or cumulative impacts are anticipated to occur.

| IV. IMPACTS ON THE HUMAN POPULATION |
|---|
| <ul style="list-style-type: none">RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.Enter "NONE" if no impacts are identified or the resource is not present. |

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

Alternative A – No Action: Hazards to Utility company employees and forest workers due to the prolonged time hazard trees are present on the site.

Alternative B – Action: The mechanical removal of hazard trees would improve safety to forest workers, utility company employees and those that use the area for recreation.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:

Identify how the project would add to or alter these activities.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify cumulative effects to the employment market.

Alternative A – No Action: Project would continue without mechanical removal of trees inside SMZ with negligible impact to employment.

Alternative B – Action: Negligible

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify cumulative effects to taxes and revenue.

Alternative A- No Action: Negligible amounts.

Alternative B- Action: Negligible amounts.

18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify cumulative effects of this and other projects on government services

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify cumulative effects to recreational and wilderness activities.

Alternative A- No Action: Ski trail and recreational cabins may have temporary use restrictions limited to weekdays. Minimal direct, indirect or cumulative impacts to quality of recreational and wilderness activities are anticipated due to treatment area is immediately adjacent to power lines.

Alternative B- Action: Ski trail and recreational cabins may have temporary use restrictions limited to weekdays. Minimal direct, indirect or cumulative impacts to quality of recreational and wilderness activities are anticipated due to hazard trees being removed are adjacent to power lines, the short length of the stream segment, and location of stream segment.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Estimate population changes and additional housing the project would require. Identify cumulative effects to population and housing.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated occur.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Estimate the return to the trust. Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify cumulative economic and social effects likely to occur as a result of the proposed action.

Alternative A- No Action: No direct, indirect, or cumulative impacts will occur.

Alternative B- Action: No direct, indirect, or cumulative impacts are anticipated to occur.

| | | |
|--------------------------------------|------------------------------------|-----------------------|
| EA Checklist Prepared By: | Name: Devin Healy | Date: 2/2/2015 |
| | Title: Helena Unit Forester | |

V. FINDING

25. ALTERNATIVE SELECTED:

Alternative B - Action: Allow SMZ Alternative Practices as proposed with additional mitigation measures.

Treatment would be limited to operation of a feller-buncher inside the 50 foot SMZ, but no closer than 25 feet to the ordinary high water mark (OHWM) unless equipment is operating while on an existing road. This treatment would be conducted on slopes less than 15% and would allow removal of lodgepole and ponderosa pine,

Douglas-fir, and/or Engelmann spruce to below minimum retention standards for short stretches as identified under Rules 4 and 5 in the *Montana Guide to the Streamside Zone Law and Rules 2006* (ARM 36.11.310-313). Additional mitigations and stipulations pertinent to this request will include:

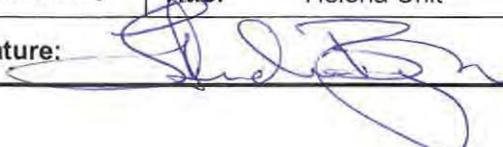
- Only operation of feller buncher type machine inside the 50 foot SMZ would be allowed, no closer than 25 feet to the ordinary high water mark (OHWM). Operation would occur in a straight in and straight out manner. A cable choker may be used to retrieve logs that the feller buncher cannot remove from the SMZ.
- Trees and slash would be placed outside of the 50 foot buffer, or in an existing roadway for skidding.
- All pilling of woody material for grinding would occur outside of the 50 foot buffer.
- Operation would only occur during periods when soil disturbance can be minimized under conditions of frozen ground to four inches and/or snow covered to eight inches.
- No trees shall be felled in or across the stream. Any debris from falling or skidding operations that enters the stream must be removed immediately.
- Mitigation measures would include grass seeding and slash filter windrows placed on disturbed areas to prevent run-off and sediment from reaching stream segments.
 - Small, healthy trees and all brush species would be retained and protected to the greatest extent possible.
 - This AP only allows for equipment operation on slopes less than 15%.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

No significant impacts to the integrity and function of the SMZ will occur with the implementation of operating restrictions and mitigation measures. As proposed, with mitigations, I do not anticipate any significant direct, indirect or cumulative effects from the implementation of the selected alternative. See Section 25 of this document to review mitigation measures.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

EIS
 More Detailed EA
 No Further Analysis

| | | |
|--|------------------------|--|
| EA Checklist Approved By: | Name: Andy Burgoyne | |
| | Title: Helena Unit | |
| Signature:  | Date: February 4, 2015 | |



United States
Department of
Agriculture

NRCS

Natural
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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 Helena National Forest Area, Montana

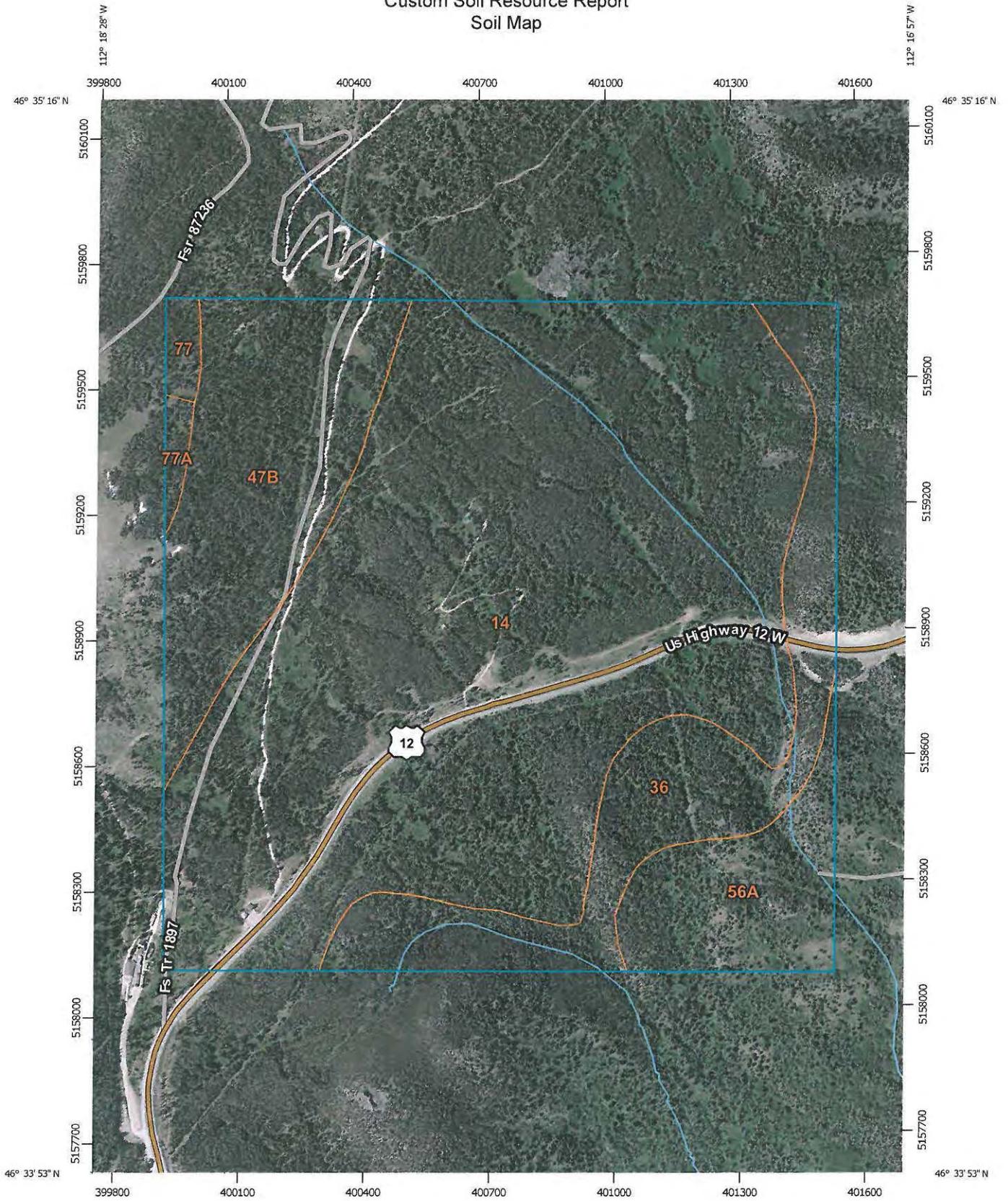


January 30, 2015

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Custom Soil Resource Report Soil Map



Map Scale: 1:12,500 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 12N WGS84

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 n

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrc.usda.gov>
 Coordinate System: Web Mercator (EPSG:3826)

Maps from the Web Soil Survey are based on the North American Datum of 1983 (NAD83) projection, which preserves direction and shape but not distance and area. A projection that preserves distance and area, such as the Albers equal-area conic projection, should be used for calculations of distance or area are required.

This product is generated from the USDA-NRCS National Engineering Laboratory version date(s) listed below.

Soil Survey Area: Helena National Forest Area
 Survey Area Data: Version 8, Sep 3, 2014

Soil map units are labeled (as space allows) for 1:250,000 scale maps or larger.

Date(s) aerial images were photographed: July 2011

The orthophoto or other base map on which the soil map was compiled and digitized probably differs from the imagery displayed on these maps. As a result, some of the map unit boundaries may be evident.

Map Unit Legend

| Helena National Forest Area, Montana (MT631) | | | |
|--|--|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| 14 | Typic Cryochrepts, colluvial deposits | 411.7 | 64.5% |
| 36 | Typic Cryoboralfs, bouldery, granitic substratum | 84.9 | 13.3% |
| 47B | Typic Cryoboralfs, basaltic substratum, cool | 88.4 | 13.9% |
| 56A | Typic Cryochrepts-Rubble land complex, steep | 44.7 | 7.0% |
| 77 | Typic Cryochrepts-Lithic Cryochrepts complex, mountain ridges | 4.9 | 0.8% |
| 77A | Argic Cryoborolls-Lithic Cryoborolls complex, basaltic substratum, mountain ridges | 3.7 | 0.6% |
| Totals for Area of Interest | | 638.3 | 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

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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 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.

Helena National Forest Area, Montana

14—Typic Cryochrepts, colluvial deposits

Map Unit Setting

National map unit symbol: v523

Elevation: 5,500 to 6,800 feet

Mean annual precipitation: 20 to 30 inches

Map Unit Composition

Typic cryochrepts and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Typic Cryochrepts

Setting

Landform: Intermontane basins, toes on mountains

Parent material: Colluvium

Typical profile

A - 0 to 4 inches: very cobbly loam

Bw1 - 4 to 40 inches: very cobbly loam

Bw2 - 40 to 60 inches: very cobbly loam

Properties and qualities

Slope: 25 to 50 percent

Depth to restrictive feature: More than 80 inches

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

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Hydrologic Soil Group: C

Other vegetative classification: spruce/twinflower (PK470), subalpine fir/twinflower (PK660)

36—Typic Cryoboralfs, bouldery, granitic substratum

Map Unit Setting

National map unit symbol: v52p

Elevation: 5,000 to 6,400 feet

Mean annual precipitation: 20 to 25 inches

Map Unit Composition

Typic cryoboralfs and similar soils: 85 percent

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Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Typic Cryoboralfs

Setting

Landform: Upland slopes

Parent material: Colluvium derived from granite and/or residuum weathered from granite

Typical profile

A1 - 0 to 7 inches: coarse sand

A2 - 7 to 23 inches: gravelly sandy loam

Bt - 23 to 57 inches: gravelly sandy clay loam

CB - 57 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 25 to 40 percent

Percent of area covered with surface fragments: 0.1 percent

Depth to restrictive feature: More than 80 inches

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 storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/pinegrass (PK320), Douglas-fir/snowberry (PK310)

47B—Typic Cryoboralfs, basaltic substratum, cool

Map Unit Setting

National map unit symbol: v532

Elevation: 5,000 to 7,000 feet

Mean annual precipitation: 20 to 25 inches

Map Unit Composition

Typic cryoboralfs and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Typic Cryoboralfs

Setting

Landform: Mountain slopes

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 10 inches: very cobbly loam

Bt - 10 to 17 inches: very cobbly loam

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

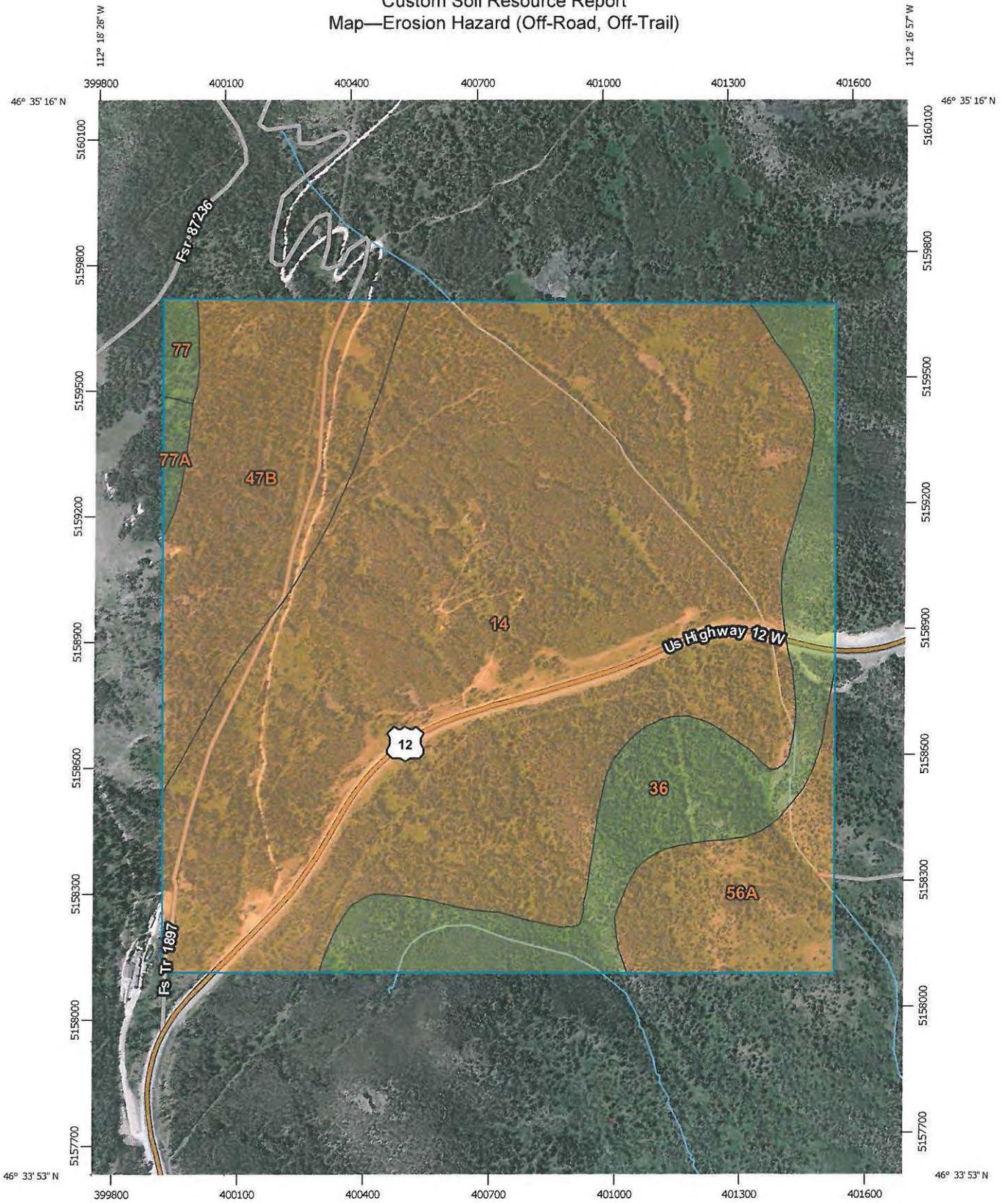
Custom Soil Resource Report

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
 Map—Erosion Hazard (Off-Road, Off-Trail)



Map Scale: 1:12,500 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons

-  Very severe
-  Severe
-  Moderate
-  Slight
-  Not rated or not available

Soil Rating Lines

-  Very severe
-  Severe
-  Moderate
-  Slight
-  Not rated or not available

Soil Rating Points

-  Very severe
-  Severe
-  Moderate
-  Slight
-  Not rated or not available

Water Features

-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways

Background

-  US Routes
-  Major Roads
-  Local Roads
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.sc.egov.usda.gov>
 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 not distance and area. A projection that preserves distance and area, such as the Albers equal-area conic projection, should be used if accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS National Soil Survey Data, the version date(s) listed below.

Soil Survey Area: Helena National Forest and National Monument
 Survey Area Data: Version 8, Sep 3, 2014

Soil map units are labeled (as space allows) for units that are 1/4 mile or larger.

Date(s) aerial images were photographed: 2011

The orthophoto or other base map on which this report was compiled and digitized probably differs from the imagery displayed on these maps. As a result, some of map unit boundaries may be evident.

Custom Soil Resource Report

Tables—Erosion Hazard (Off-Road, Off-Trail)

| Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Helena National Forest Area, Montana (MT631) | | | | | | |
|--|--|----------|--------------------------|---------------------------------|--------------|----------------|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| 14 | Typic Cryochrepts, colluvial deposits | Severe | Typic Cryochrepts (90%) | Slope/erodibility (0.75) | 411.7 | 64.5% |
| 36 | Typic Cryoboralfs, bouldery, granitic substratum | Moderate | Typic Cryoboralfs (85%) | Slope/erodibility (0.50) | 84.9 | 13.3% |
| 47B | Typic Cryoboralfs, basaltic substratum, cool | Severe | Typic Cryoboralfs (85%) | Slope/erodibility (0.75) | 88.4 | 13.9% |
| 56A | Typic Cryochrepts-Rubble land complex, steep | Severe | Typic Cryochrepts (60%) | Slope/erodibility (0.75) | 44.7 | 7.0% |
| 77 | Typic Cryochrepts-Lithic Cryochrepts complex, mountain ridges | Moderate | Typic Cryochrepts (45%) | Slope/erodibility (0.50) | 4.9 | 0.8% |
| | | | Lithic Cryochrepts (40%) | Slope/erodibility (0.50) | | |
| 77A | Argic Cryoborolls-Lithic Cryoborolls complex, basaltic substratum, mountain ridges | Moderate | Argic Cryoborolls (75%) | Slope/erodibility (0.50) | 3.7 | 0.6% |
| | | | Lithic Cryoborolls (15%) | Slope/erodibility (0.50) | | |
| Totals for Area of Interest | | | | | 638.3 | 100.0% |

| Erosion Hazard (Off-Road, Off-Trail)— Summary by Rating Value | | |
|---|--------------|----------------|
| Rating | Acres in AOI | Percent of AOI |
| Severe | 544.8 | 85.4% |
| Moderate | 93.5 | 14.6% |
| Totals for Area of Interest | 638.3 | 100.0% |

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Compaction Resistance

This interpretation rates each soil for its resistance to compaction. Compaction tends to reduce water infiltration which affects plant production and composition, increases runoff which generally increased erosion rates, and affects organisms living within the soil.

Compaction is predominantly influenced by moisture content, depth to saturation, percent of sand, silt, and clay, soil structure, organic matter content, and content of coarse fragments.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are made suitable by all of the soil features that affect the suitability of soil material for churning. "High resistance" indicates that the soil has features that are very favorable to resisting compaction. "Moderate resistance" indicates that the soil has features that are favorable to resisting compaction. "Low resistance" indicates that the soil has one or more features that favor the formation of a compacted layer.

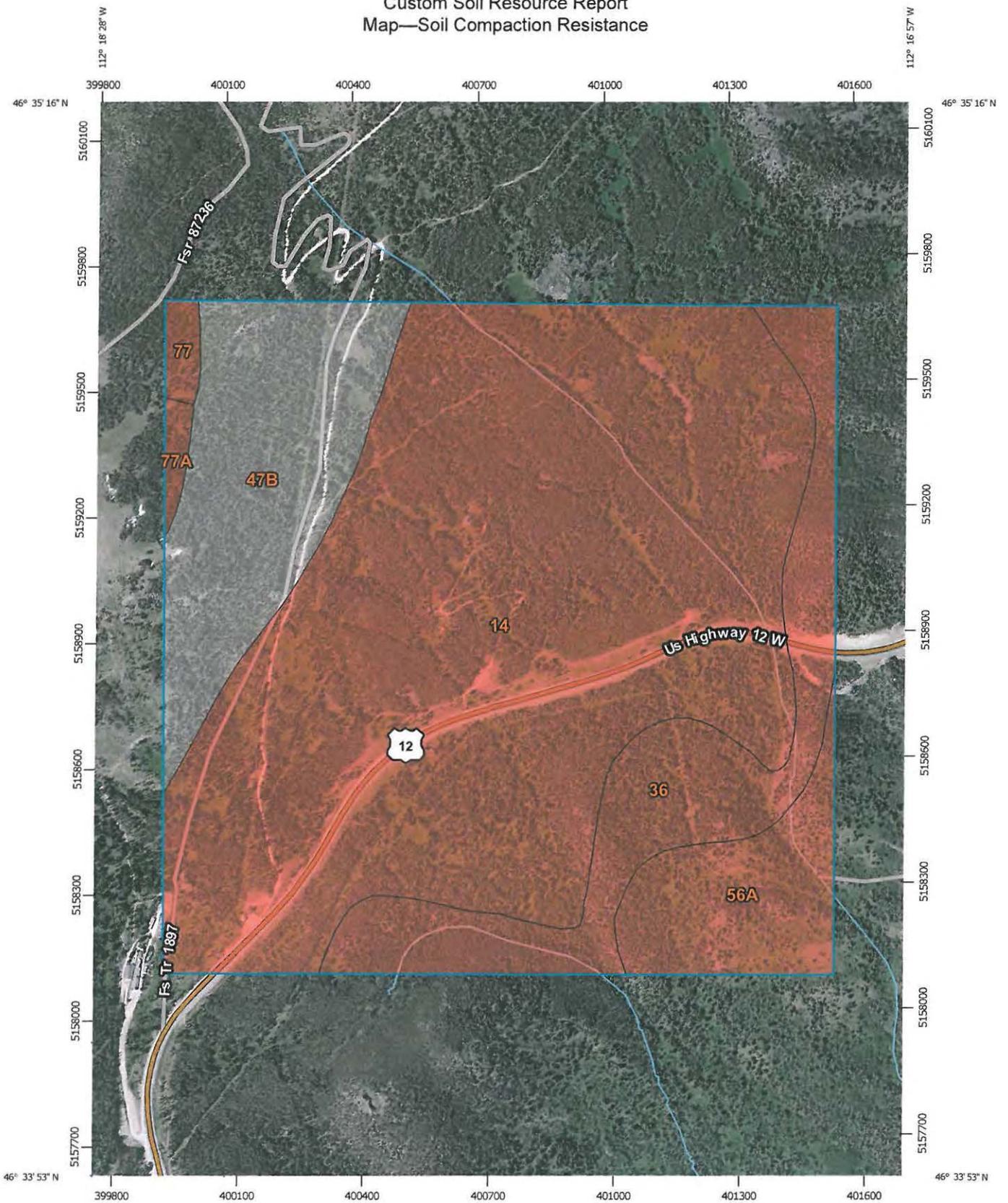
The overall rating class for each soil is assigned based on the product of the numerical ratings of the individual soil properties considered in the interpretation, some of which may not be displayed.

Numerical ratings indicate the level of the soil's resistance to compaction. The ratings are shown in decimal fractions ranging from 1.00 to 0.01. They indicate gradations between the point at which a soil feature has the greatest positive impact on resistance to compaction (1.00) and the point at which the soil feature has the greatest negative impact (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report Map—Soil Compaction Resistance



Map Scale: 1:12,500 if printed on A portrait (8.5" x 11") sheet.

0 150 300 600 900 Meters

0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

| | |
|--|--|
| Area of Interest (AOI) | Background |
|  Area of Interest (AOI) |  Aerial Photography |
| Soils | |
| Soil Rating Polygons | |
|  Low resistance | |
|  Moderate resistance | |
|  High resistance | |
|  Not rated or not available | |
| Soil Rating Lines | |
|  Low resistance | |
|  Moderate resistance | |
|  High resistance | |
|  Not rated or not available | |
| Soil Rating Points | |
|  Low resistance | |
|  Moderate resistance | |
|  High resistance | |
|  Not rated or not available | |
| Water Features | |
|  Streams and Canals | |
| Transportation | |
|  Rails | |
|  Interstate Highways | |
|  US Routes | |
|  Major Roads | |
|  Local Roads | |

MAP INFORMATION

The soil surveys that comprise your AOI were n

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

Source of Map: Natural Resources Conserva
 Web Soil Survey URL: <http://websoilsurvey.n>
 Coordinate System: Web Mercator (EPSG:3

Maps from the Web Soil Survey are based on t
 projection, which preserves direction and shap
 distance and area. A projection that preserves
 Albers equal-area conic projection, should be u
 calculations of distance or area are required.

This product is generated from the USDA-NRC
 the version date(s) listed below.

Soil Survey Area: Helena National Forest Ar
 Survey Area Data: Version 8, Sep 3, 2014

Soil map units are labeled (as space allows) for
 or larger.

Date(s) aerial images were photographed: J
 2011

The orthophoto or other base map on which th
 compiled and digitized probably differs from th
 imagery displayed on these maps. As a result,
 of map unit boundaries may be evident.

Custom Soil Resource Report

Tables—Soil Compaction Resistance

| Soil Compaction Resistance— Summary by Map Unit — Helena National Forest Area, Montana (MT631) | | | | | | |
|--|---|----------------|--------------------------|----------------------------------|--------------|----------------|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| 14 | Typic Cryochrepts, colluvial deposits | Low resistance | Typic Cryochrepts (90%) | Vegetative productivity (0.00) | 411.7 | 64.5% |
| | | | | Content of sand (0.59) | | |
| | | | | Content of clay (0.75) | | |
| | | | | Content of organic matter (0.98) | | |
| 36 | Typic Cryoboralfs, bouldery, granitic substratum | Low resistance | Typic Cryoboralfs (85%) | Vegetative productivity (0.00) | 84.9 | 13.3% |
| | | | | Content of organic matter (0.91) | | |
| 47B | Typic Cryoboralfs, basaltic substratum, cool | Not rated | Typic Cryoboralfs (85%) | | 88.4 | 13.9% |
| 56A | Typic Cryochrepts-Rubble land complex, steep | Low resistance | Typic Cryochrepts (60%) | Vegetative productivity (0.00) | 44.7 | 7.0% |
| | | | | Content of sand (0.70) | | |
| | | | | Content of organic matter (0.91) | | |
| 77 | Typic Cryochrepts-Lithic Cryochrepts complex, mountain ridges | Low resistance | Typic Cryochrepts (45%) | Vegetative productivity (0.00) | 4.9 | 0.8% |
| | | | | Content of sand (0.59) | | |
| | | | | Content of clay (0.81) | | |
| | | | Lithic Cryochrepts (40%) | Vegetative productivity (0.00) | | |
| | | | | Content of sand (0.59) | | |
| | | | | Content of clay (0.81) | | |

Custom Soil Resource Report

| Soil Compaction Resistance— Summary by Map Unit — Helena National Forest Area, Montana (MT631) | | | | | | |
|--|--|----------------|--------------------------|----------------------------------|--------------|----------------|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| | | | | Content of organic matter (0.98) | | |
| 77A | Argic Cryoborolls-Lithic Cryoborolls complex, basaltic substratum, mountain ridges | Low resistance | Argic Cryoborolls (75%) | Vegetative productivity (0.00) | 3.7 | 0.6% |
| | | | | Content of sand (0.62) | | |
| | | | | Content of clay (0.73) | | |
| | | | | Content of rock fragments (0.92) | | |
| | | | | Content of organic matter (0.99) | | |
| Totals for Area of Interest | | | | | 638.3 | 100.0% |

| Soil Compaction Resistance— Summary by Rating Value | | |
|---|--------------|----------------|
| Rating | Acres in AOI | Percent of AOI |
| Low resistance | 549.9 | 86.1% |
| Null or Not Rated | 88.4 | 13.9% |
| Totals for Area of Interest | 638.3 | 100.0% |

Rating Options—Soil Compaction Resistance

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Harvest Equipment Operability

Ratings for this interpretation indicate the suitability for use of forestland harvesting equipment. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, and ponding. Standard rubber-tire skidders and bulldozers are assumed to be used for ground-based harvesting and transport.

The ratings are both verbal and numerical. Rating class terms indicate the degree to which the soils are suited to this aspect of forestland management. "Well suited" indicates that the soil has features that are favorable for the specified management aspect and has no limitations. Good performance can be expected, and little or no maintenance is needed. "Moderately suited" indicates that the soil has features that are moderately favorable for the specified management aspect. One or more soil properties are less than desirable, and fair performance can be expected. Some

Custom Soil Resource Report

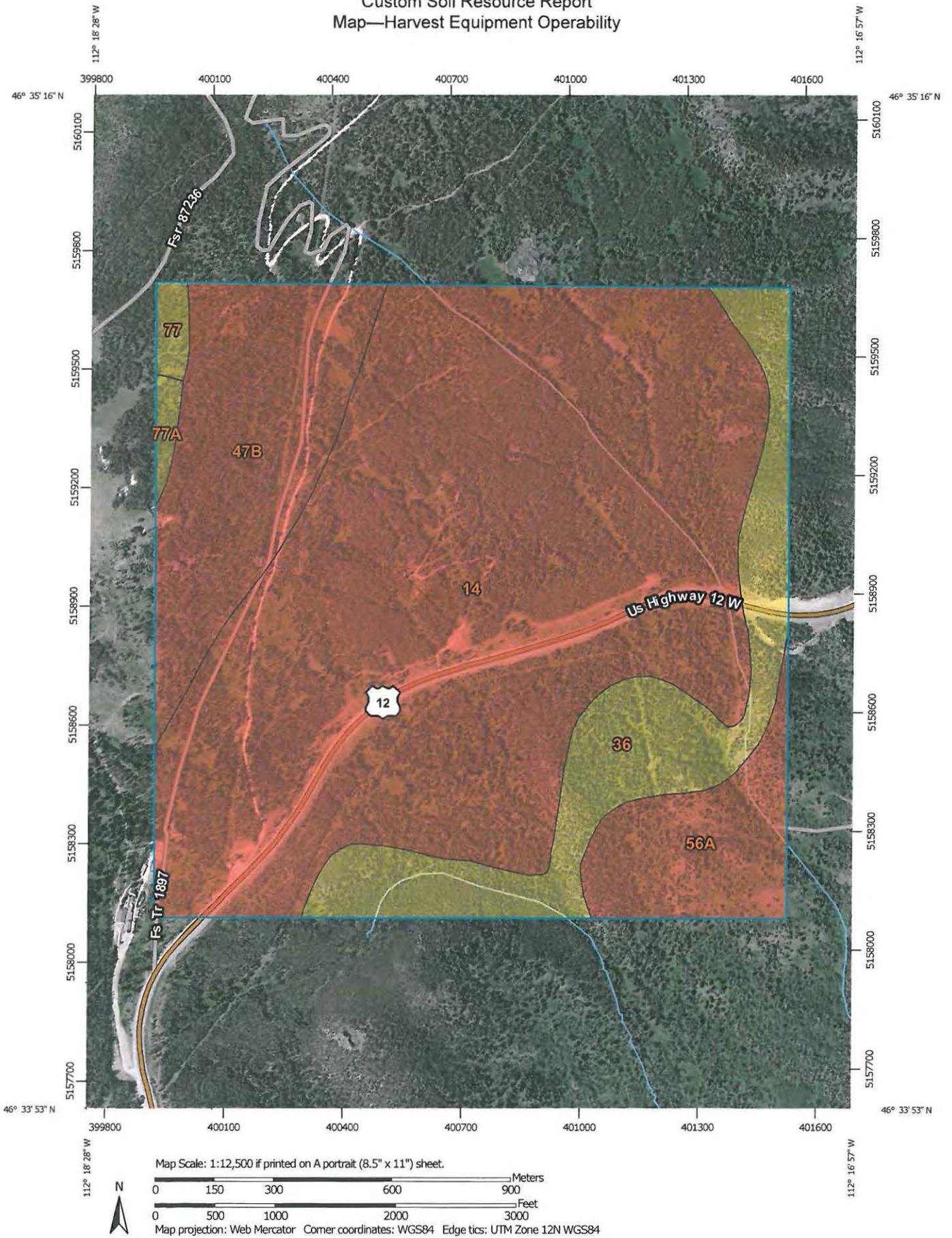
maintenance is needed. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for the specified management aspect. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report Map—Harvest Equipment Operability



MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Background**
 -  Aerial Photography
- Soils**
 - Soil Rating Polygons**
 -  Poorly suited
 -  Moderately suited
 -  Well suited
 -  Not rated or not available
 - Soil Rating Lines**
 -  Poorly suited
 -  Moderately suited
 -  Well suited
 -  Not rated or not available
 - Soil Rating Points**
 -  Poorly suited
 -  Moderately suited
 -  Well suited
 -  Not rated or not available
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were:

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 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 not distance and area. A projection that preserves distance and area, such as the Albers equal-area conic projection, should be used for calculations of distance or area are required.

This product is generated from the USDA-NRCS National Soil Survey Data the version date(s) listed below.

Soil Survey Area: Helena National Forest Area
 Survey Area Data: Version 8, Sep 3, 2014

Soil map units are labeled (as space allows) for the map scale or larger.

Date(s) aerial images were photographed: 2011

The orthophoto or other base map on which this report is compiled and digitized probably differs from the imagery displayed on these maps. As a result, some of map unit boundaries may be evident.

Custom Soil Resource Report

Tables—Harvest Equipment Operability

| Harvest Equipment Operability— Summary by Map Unit — Helena National Forest Area, Montana (MT631) | | | | | | |
|---|--|-------------------|--------------------------|---------------------------------|--------------|----------------|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| 14 | Typic Cryochrepts, colluvial deposits | Poorly suited | Typic Cryochrepts (90%) | Slope (1.00) | 411.7 | 64.5% |
| | | | | Dusty (0.32) | | |
| 36 | Typic Cryoboralfs, bouldery, granitic substratum | Moderately suited | Typic Cryoboralfs (85%) | Slope (0.50) | 84.9 | 13.3% |
| | | | | Sandiness (0.50) | | |
| 47B | Typic Cryoboralfs, basaltic substratum, cool | Poorly suited | Typic Cryoboralfs (85%) | Slope (1.00) | 88.4 | 13.9% |
| | | | | Dusty (0.29) | | |
| 56A | Typic Cryochrepts-Rubble land complex, steep | Poorly suited | Typic Cryochrepts (60%) | Slope (1.00) | 44.7 | 7.0% |
| | | | | Sandiness (0.50) | | |
| | | | | Dusty (0.03) | | |
| 77 | Typic Cryochrepts-Lithic Cryochrepts complex, mountain ridges | Moderately suited | Typic Cryochrepts (45%) | Dusty (0.31) | 4.9 | 0.8% |
| | | | Lithic Cryochrepts (40%) | Dusty (0.31) | | |
| 77A | Argic Cryoborolls-Lithic Cryoborolls complex, basaltic substratum, mountain ridges | Moderately suited | Argic Cryoborolls (75%) | Low strength (0.50) | 3.7 | 0.6% |
| | | | | Dusty (0.44) | | |
| | | | Lithic Cryoborolls (15%) | Low strength (0.50) | | |
| | | | | Dusty (0.36) | | |
| Totals for Area of Interest | | | | | 638.3 | 100.0% |

| Harvest Equipment Operability— Summary by Rating Value | | |
|--|--------------|----------------|
| Rating | Acres in AOI | Percent of AOI |
| Poorly suited | 544.8 | 85.4% |
| Moderately suited | 93.5 | 14.6% |
| Totals for Area of Interest | 638.3 | 100.0% |

Rating Options—Harvest Equipment Operability

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Plant Species of Concern

Species List Last Updated 06/18/2014



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Natural Resources
operated by

1 Species of Concern

Filtered by the following criteria:

Township = 10 N Range = 6 W (based on mapped Species Occurrences)

Species of Concern

1 Species

Filtered by the following criteria:

Township = 10 N Range = 6 W (based on mapped Species Occurrences)

FLOWERING PLANTS - DICOTS (MAGNOLIOPSIDA)

FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 6 W (BASED ON MAPPED SPECIES OCCURRENCES)

| SCIENTIFIC NAME COMMON NAME TAXA SORT | OTHER NAMES | FAMILY (SCIENTIFIC) FAMILY (COMMON) | GLOBAL RANK | STATE RANK | USFWS | USFS | BLM | MNP CA |
|--|--------------------|--|----------------|---------------|-------|-----------|-----------|-----------|
| Phlox kelseyi var. missoulensis Missoula Phlox | Phlox missoulensis | Polemoniaceae Phlox Family | G3 | S3 | | SENSITIVE | SENSITIVE | |
| <p>Species verified in these Counties: Cascade, Granite, Jefferson, Judith Basin, Lewis and Clark, and Richland.</p> <p>State Rank Reason: Missoula phlox is a state endemic known from over 2 dozen occurrences in Montana. Populations are moderate to large-sized. Populations occur on a mix of ownerships, including private lands and public lands. Waterworks Hill population is infested with several noxious weeds and heavy recreational trail use is common. Other populations appear to be at much less risk though some impacts from invasive weeds are possible.</p> | | | | | | | | |

Citation for data on this website:

Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 1/28/2015, from <http://mtnhp.org/SpeciesOfConcern/?AorP=p>

Animal Species of Concern

Species List Last Updated 04/21/2014



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operated by

12 Species of Concern

Filtered by the following criteria:

Township = 10 N Range = 6 W (based on mapped Species Occurrences)

Species of Concern

12 Species

Filtered by the following criteria:

Township = 10 N Range = 6 W (based on mapped Species Occurrences)

MAMMALS (MAMMALIA)

FILTERED BY THE FOLLOWING CRITERIA
TOWNSHIP = 10 N RANGE = 6 W (BASED ON MAPPED SPECIES OCCURRENCES)

| SCIENTIFIC NAME COMMON NAME TAXA SORT | FAMILY (SCIENTIFIC) FAMILY (COMMON) | GLOBAL RANK | STATE RANK | USFWS | USFS | BLM | CFWCS TIER ID | % OF GLOBAL BREEDING RANGE IN MT | |
|--|--|----------------|---------------|-------|------------|----------------|---------------|--|--|
| Gulo gulo Wolverine | Mustelidae Weasels | G4 | S3 | C | SENSITIVE | SENSITIVE | 2 | 0% | |
| Species verified in these Counties: Beaverhead, Broadwater, Carbon, Cascade, Deer Lodge, Flathead, Gallatin, Glacier, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone | | | | | | | | | |
| Lasiurus cinereus Hoary Bat | Vespertilionidae Bats | G5 | S3 | | | | 2 | 2% | |
| Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone | | | | | | | | | |
| Lynx canadensis Canada Lynx | Felidae Cats | G5 | S3 | LT | THREATENED | SPECIAL STATUS | 1 | 1% | |
| Species verified in these Counties: Carbon, Flathead, Gallatin, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Missoula, Musselshell, Sweet Grass, Teton | | | | | | | | | |
| Martes pennanti Fisher | Mustelidae Weasels | G5 | S3 | | SENSITIVE | SENSITIVE | 2 | 1% | |
| Species verified in these Counties: Beaverhead, Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clark, Lincoln, Madison, Park, Ravalli, Sanders, Teton | | | | | | | | | |
| Myotis lucifugus Little Brown Myotis | Vespertilionidae Bats | G3 | S3 | | | | 3 | 3% | |
| Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone | | | | | | | | | |

BIRDS (AVES)

FILTERED BY THE FOLLOWING CRITERIA
TOWNSHIP = 10 N RANGE = 6 W (BASED ON MAPPED SPECIES OCCURRENCES)

| SCIENTIFIC NAME COMMON NAME TAXA SORT | FAMILY (SCIENTIFIC) FAMILY (COMMON) | GLOBAL RANK | STATE RANK | USFWS | USFS | BLM | CFWCS TIER ID | % OF GLOBAL BREEDING RANGE IN MT | |
|---|--|----------------|---------------|-------|------|-----|---------------|--|--|
| Catharus fuscescens Veery | Turdidae Thrushes | G5 | S3B | | | | 2 | 6% | |
| Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Mineral, Missoula, Musselshell, Park, Pondera, Powder River, Powell, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone | | | | | | | | | |

| | | | | | | | | | | |
|---|---|----|----|--|--|--|---|-----|--|--|
| Certhia americana Brown Creeper | Certhiidae Creepers | G5 | S3 | | | | 2 | 4% | | |
| Species verified in these Counties: Beaverhead, Broadwater, Carbon, Carter, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Powder River, Powell, Stillwater, Sweet Grass, Teton, Wheatland | | | | | | | | | | |
| Coccothraustes vespertinus Evening Grosbeak | Fringillidae Finches | G5 | S3 | | | | 3 | 3% | | |
| Species verified in these Counties: Beaverhead, Broadwater, Carter, Cascade, Chouteau, Fergus, Flathead, Gallatin, Glacier, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Pondera, Powder River, Powell, Stillwater, Sweet Grass, Teton, Wheatland State Rank Reason: Populations in Montana and across North America have experienced rangewide declines, although the cause is unclear (Bonter and Harvey 2008). | | | | | | | | | | |
| Dryocopus pileatus Pileated Woodpecker | Picidae Woodpeckers | G5 | S3 | | | | 2 | 1% | | |
| Species verified in these Counties: Beaverhead, Broadwater, Cascade, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Powell, Ravalli, Sanders, Silver Bow | | | | | | | | | | |
| Haemorhous cassinii Cassin's Finch | Fringillidae Finches | G5 | S3 | | | | 3 | 11% | | |
| Species verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Pondera, Powder River, Powell, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone | | | | | | | | | | |
| Nucifraga columbiana Clark's Nutcracker | Corvidae Jays / Crows / Magpies | G5 | S3 | | | | 3 | 9% | | |
| Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Deer Lodge, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Phillips, Pondera, Powder River, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Wheatland | | | | | | | | | | |

FISH (ACTINOPTERYGII)

FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 6 W (BASED ON)

| SCIENTIFIC NAME COMMON NAME TAXA SORT | FAMILY (SCIENTIFIC) FAMILY (COMMON) | GLOBAL RANK | STATE RANK | USFWS | USFS | BLM | CFWCS TIER ID | % OF GLOBAL BREEDING RANGE IN MT | | |
|---|--|-------------|------------|-------|-----------|-----------|---------------|----------------------------------|--|--|
| Oncorhynchus clarkii lewisi Westslope Cutthroat Trout | Salmonidae Trout | G4T3 | S2 | | SENSITIVE | SENSITIVE | 1 | | | |
| Species verified in these Counties: Beaverhead, Broadwater, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow | | | | | | | | | | |

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