Pueblo-Lone Mountain Biological Crust Exclosure

Environmental Assessment
OR-06-026-053

Bureau of Land Management
Burns District Office
28910 Hwy 20 West
Hines, Oregon 97738

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PUEBLO-LONE MOUNTAIN
BIOLOGICAL CRUST EXCLOSURE

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CHAPTER I: INTRODUCTION: PURPOSE OF AND NEED FOR ACTION

A. Summary of the Proposal

The proposal is to construct a small 12m by 3m exclosure in the Rincon Wilderness Study Area (WSA), north of Foothills Road (T. 39 S., R. 32 E., Section 27, NESE). The exclosure would be temporary in nature, constructed by wiring 4-foot by 16-foot heavy gauge "bull panels" to 5 ½-foot steel fenceposts. The exclosure could be removed at a later date once monitoring objectives are met. This exclosure is required in order to complete court-ordered monitoring efforts. This project would be completed in summer/fall 2006.

B. Purpose of Need for Action

Biological Soil Crust (BSC) data specific to the northern Great Basin has been lacking in the past. New studies are underway in Pueblo-Lone Mountain Allotment. An exclosure is needed in Rincon WSA portion of the allotment to complete the study.

Research conducted by Ponzetti and McCune provides insight concerning disturbance of BSC communities in the planning area. New monitoring studies are proposed in this document for Pueblo-Lone Mountain Allotment and other allotments in the planning area in order to inform future management actions.

This document is part of a series of actions taken by Burns District Bureau of Land Management (BLM) to comply with a settlement (signed on November 13 and 15, 2001) between BLM and appellants Elaine Rees and Oregon Natural Desert Association.

For a discussion on how BSCs contribute to the functional, structural, and compositional parts of a functioning ecosystem see the technical reference TR-1730-2.

The purpose is to complete the aforementioned BSC study by construction of a small exclosure. This exclosure would surround a control transect.

Noxious Weeds Stipulation: The stipulation is to treat noxious weeds and inventory for new infestations using the most effective means available as outlined in the Burns District's Integrated Management Program Environmental Assessment (EA)/Decision Record when implementing the construction and removal of the exclosure.

C. Conformance with Land Use Plans

The analysis in this EA is in conformance with, and tiered to, the Andrews Management Unit Record of Decision/Resource Management Plan (ROD/RMP), 2005 and Final Environmental Impact Statement (EIS), 2004. All pertinent information in those documents is incorporated by reference into this EA. Of special interest and importance are the sections in the ROD/RMP/EIS concerning BSC, Andrews Management Unit ROD and RMP, Page 21.

The proposal is also in conformance with State, local, and Tribal land use plans, laws, and regulations.

CHAPTER II: ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. No Action Alternative

Under this alternative, the proposed action alternative as described would not be implemented.

B. Proposed Action Alternative

The proposed action is to construct a small 12m by 3m exclosure in Rincon WSA. This structure would be built by wiring heavy gauge steel "bull panels" to 5 ½-foot steel green fenceposts. The "bull panels" would be light gray in color. The structure would be located in an area of the Rincon WSA where terrain features would screen it from the casual observer. Materials would be hand carried from Foothills Road to the chosen site. The exclosure would be removed at a later date once monitoring objectives are met.

CHAPTER III: DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Introduction

The following is a description of the existing environmental conditions and management direction in the project area. Those resources that are deemed critical elements will be discussed first; followed by the noncritical elements. This chapter gives detail on the baseline condition of the project area and facilitates the comparison of the two alternatives.

The project area lies entirely within the Basin and Range Province. This province is characterized by large, normal faults, tending a northerly direction. These faults have produced numerous fault-block mountain ranges and basins of internal drainages. The Pueblo Mountains located to the east, are a good example of a fault-block tilting to the west and bounded on the east by large fault scarps reaching an elevation of 8,632 feet on Pueblo Peak. The project area lies due west of the Pueblos. The main physical features within the area are Catlow Rim, Oregon End Table, and Lone Mountain.

B. Critical Elements

The following critical elements of the human environment are not present or would not be affected by the proposed action or the alternative: Areas of Critical Environmental Concern, Air Quality, American Indian Traditional Practices, Cultural Heritage, Environmental Justice, Prime or Unique Farmlands, Flood Plains, Hazardous Materials, Migratory Birds, Paleontology, Special Status Species (Flora or Fauna), Water Quality, Wetlands and Riparian Zones, Wilderness, Wild and Scenic Rivers. These elements will not be discussed further in this document.

The following critical elements occur within the area of potential effect and could be affected by the proposed action or no action alternatives.

1. Wilderness Study Areas

The proposed exclosure site is located within Rincon WSA. Wilderness characteristics of Rincon WSA (104,980 acres) are summarized from Volume I of the Oregon BLM Wilderness Study Report (1991).

Wilderness characteristics include naturalness, outstanding opportunities for solitude or primitive and unconfined recreation, and the presence of special features. The following definitions are from BLM Manual Handbook H-8550-1 – Interim Management Policy (IMP) for Lands Under Wilderness Review. ***Naturalness*** - refers to an area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." ***Solitude*** - is defined as "the state of being alone or remote from habitations; isolation. A lonely, unfrequented, or secluded place." ***Primitive and Unconfined Recreation*** - is defined as nonmotorized and undeveloped types of outdoor recreation activities. ***Special Features*** - are listed in the Wilderness Act as "ecological, geological, or other features of scientific, educational, scenic, or historical value."

Naturalness**:** Rincon WSA appears to be in a relatively natural condition. The WSA contains a variety of distinct natural features, including portions of Catlow Rim, Lone Mountain, and Oregon End Table. The WSA provides habitat for a wide variety of bird, mammal, and reptile species using the big sagebrush, low sagebrush, and antelope bitterbrush habitats, cliffs, and rugged canyons. Raptors commonly nest along Catlow Rim. None of the 75 developments within Rincon WSA are substantially noticeable. These developments include 26 reservoirs, 8 wildlife guzzlers, 6 spring developments, 32 vehicle ways totaling 52 miles, an old mining prospect, and fences totaling 23 miles. Outside sights and sounds that minimally affect naturalness are the boundary roads, two crested wheatgrass seedings, a ranch, a cow camp, and several small water developments.

***Solitude*:** Opportunities for solitude in Rincon WSA are outstanding. These opportunities are enhanced by the area's size and the diverse topography, particularly rolling hills, rugged rock outcroppings, and rims and elevation differences associated with Catlow Rim and Oregon End Table. The only vegetative screening is some western juniper on the south side of Lone Mountain. Vegetative screening does not enhance opportunities for solitude.

***Primitive and Unconfined Recreation*:** Rincon WSA provides outstanding opportunities for primitive recreation, including day hiking, camping, backpacking, horseback riding, hunting, observing wildlife, sightseeing, and photography. The primary attractions for day hiking, backpacking, or horseback riding would be Catlow Rim, Lone Mountain, and Oregon End Table. There are abundant level areas suitable for camping, but the availability of water limits overnight use. Game species in the area include mule deer, pronghorn antelope, and chukars. Opportunities for observing wildlife, sightseeing, and photography are outstanding around Catlow Rim, Lone Mountain, Oregon End Table, and various other points.

***Special Features*:** Wildlife, geologic, cultural, and vegetative features add to the value of Rincon WSA as wilderness. Wildlife is a special feature because of the high-quality raptor nesting area, crucial pronghorn antelope winter range, crucial mule deer winter range, bighorn sheep habitat, Greater sage-grouse strutting grounds, and possible kit fox habitat. The WSA's geology is a special feature because Catlow Rim, a prominent fault scarp, forms the western edge of the Steens Mountain fault block. The rim, which also serves as the eastern boundary of Catlow Valley, is characterized by Pleistocene shoreline features, including gravel bars, spits, wave-built terraces, and wave-cut benches. Noteworthy cultural resources include a well-known cave and an area with rock art. There is one plant species of special interest.

2. Noxious Weeds

Currently, there are no noxious weeds identified in the proposed site.

C. Noncritical Elements

The following noncritical elements occur within the area of potential effect and could be affected by the proposed action or no action alternatives.

1. Wildlife

Wildlife common to the area include mule deer and antelope, while bighorn sheep are found among the steep and rocky rims. Nongame species include jackrabbit, antelope ground squirrel, bushy-tailed woodrat, small footed myotis (bat), golden eagles, canyon and rock wrens. Upland game birds include chukars and valley quail.

2. Recreation

Recreation opportunities within the area include dispersed camping, big game hunting for mule deer, pronghorn antelope, and bighorn sheep, and upland game bird hunting for chukars and quail.

3. Visual Resources

The project falls within Visual Resource Management (VRM) Class I area. VRM Class I objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. The landscape is characterized by low rolling hills with gray-green sagebrush and green perennial grasses. Soil colors are light tan. A two-track road provides access to the site and is the only human-made feature in the immediate vicinity.

4. Grazing Management

The area falls within the Pueblo-Lone Mountain Grazing Allotment. There are currently three grazing permittees within the allotment.

5. Biological Soil Crusts

"Biological soil crusts are also known as cryptogamic, microbiotic, cryptobiotic, and microphytic crusts, leading to some confusion. The names are all meant to indicate common features of the organisms that compose the crusts. The most inclusive term is probably **biological soil crust**, as this distinguishes them from physical crusts while not limiting crust components to plants. Whatever name used, there remains an important distinction between these formations and physical or chemical crusts" (Belnap, http://www.soilcrust.org/crust101.htm).

Identification of BSCs at the species level is often not practical for field work. The use of some basic morphological groups simplifies the situation. Morphological groups are also useful because they are representative of the ecological function of the organisms (Page 6, TR-1730-2). Document available upon request.

Using a classification scheme proposed in 1994 microbiota such as BSC can be divided into three groups based on their physical location in relation to the soil: hypermorphic (aboveground), perimorphic (at ground), and cryptomorphic (belowground).

Preliminary field observations in 2002 and 2003 indicate that the planning area contains primarily perimorphic and secondarily hypermorphic BSCs.

Hypermorphic BSCs are found primarily on more stable soils and are generally the most susceptible to disturbance; perimorphic BSCs which are the dominant form in the planning area occur both above and below the soil surface and are intermediate in their tolerance of disturbance; cryptomorphic BSCs are the most difficult to observe and occur to an lesser known extent within the planning area, this group of microbiota is also the most tolerant to disturbance (Evans and Johansen 1999).

The morphological groups are:

(Definitions are found on Pages 6 and 7 in TR-1730-2.)

1. Cyanobacteria - Perimorphic/cryptomorphic
2. Algae - Perimorphic/cryptomorphic
3. Micro-fungi - Cryptomorphic/perimorphic
4. Short moss (under10mm) - Hypermorphic
5. Tall moss (over 10mm) - Hypermorphic
6. Liverwort - Hypermorphic
7. Crustose lichen - Perimorphic
8. Gelatinous lichen - Perimorphic
9. Squamulose lichen - Perimorphic
10. Foliose lichen - Perimorphic
11. Fruticose lichen - Perimorphic

Morphological groups 1, 4, 5, and 7 will likely be the dominant groups represented in the project area. Morphological group 2 is hard to observe, but may be observable at some sites; group 3 is very difficult to observe unless the fruiting bodies are present and these tend to be very minute and often require an organic substrate to induce fruiting. Group 6 does occur in some sections of the allotment and groups 9, 10, and 11 seem to be far less frequent within the District as a rule (Personal observation; Linn, 2004).

Factors influencing distribution of BSCs (TR-1730-2) include, but are not limited to, the following:

Elevation - BSC cover is greatest at inland elevations under 1,000m. Lichen and moss components generally increase with elevation until vascular plant cover dominates the site.

Soils and Topography - Shallow soils support greater total BSC cover than deep more productive soils. As coarse soil texture increases, total BSC cover decreases. In more unstable soil types the representation of hypermorphic morphological groups such as short and tall moss may be exclusively under vascular plant cover (TR-1730-2). Percent rock cover influences total BSC cover as well; embedded rocks provide armor for the microbiota contained within the soil interspaces. Preliminary field observations by Burns District staff in 2002 and 2003 indicate that some of the most developed BSC communities in the planning area occur in these highly rocky unproductive systems. North and east slopes generally favor crustal development due to the moisture and temperature requirements for optimal physiological activity. Calcareous and gypsiferous soils can support higher species richness. The soil chemistry gradient has been shown to be the "strongest explanatory factor for the compositional difference among research sites." (Page 223. Ponzetti and McCune 2001).

Disturbance - The intensity of disturbance and the time since disturbance can influence the community composition and total cover of BSC communities. The type of disturbance is a fundamental consideration as well; compressional stress from vehicles, wild horses, livestock, and human footprints can modify BSC communities. As stated by Ponzetti and McCune on Page 223 of their 2001 publication; "...the compositional effects of grazing were overwhelmed by the stronger soil chemistry and climate gradients. However, grazing-related differences were clearly discernable with statistical methods that accounted for the blocked design of the study." BSCs may serve as an early warning system as they appear to be more sensitive to livestock-related impacts than are vascular plants.

Timing of precipitation - Moisture regimes can play a large role in crustal community composition. The presence or absence of fog in a desert system can influence the abundance of mosses and other microbiota under shrubs due to the collection of moisture by the shrub. Fog seems to play some role in the planning area, the extent to which is not known, but field observations correlate with the expected occurrence of well-developed crustal communities under shrubs receiving some increase in moisture interception.

BSCs play a role in a functioning ecosystem. On Page 29 of TR-1730-2 it states that in "... a given ecoregion, ecological roles of biological soil crusts can vary widely in their importance and will depend on crust composition and biomass, as well as characteristics of the specific ecosystem being considered."

Carbon fixation, nitrogen fixation, and increased soil oxygen content (during active photosynthesis) are beneficial contributions to the ecosystem resulting from BSCs. The effect of crustal communities on soil water relations is highly site dependent (TR-1730-2). Soil surface microtopography and aggregate stability are important contributions from BSCs as they increase the residence time of moisture and reduce erosional processes. The influence of BSCs on infiltration rates and hydraulic conductivity varies greatly; generally speaking infiltration rates increase in pinnacled crusts and decrease in flat crust microtopographies. The northern Great Basin has a rolling BSC microtopography and the infiltration rates are probably intermediate compared to flat or pinnacled crustal systems.

6. Soils

The soils of Pueblo-Lone Mountain Allotment, which include the project area, are categorized by soil depth and temperature to form the general soil groupings. Soil depth correlates with the landforms while the soil temperature correlates with precipitation and frost-free periods.

The soils in the project area are the Lonely-Robson Series. These soils are shallow to moderately deep, well-drained, and occur on flat to gently sloping topography. The soil texture is cobbly clay loam and the erosion potential is low.

7. Vegetation

Within the area of the proposed action vegetation consists of big sagebrush which is the dominant shrub species over most of the area. Large areas of Wyoming sagebrush cover slopes and flats throughout the area. Basin big sagebrush is common in many of the creek bottoms and on sites with deeper soils. Mountain big sagebrush is found above 6,500 feet in elevation. Idaho fescue, bluebunch wheatgrass, Thurber's needlegrass, mountain brome, cheatgrass, Sandberg's bluegrass, and bottlebrush squirreltail are common grass species over much of the sagebrush covered rangelands. Some of the common forbs of the area include low pussytoes, tailcup lupine, arrowleaf balsamroot, penstemon, agoseris, aster, draba, Indian paintbrush, Mariposa and sego lilies, evening primrose, and iris.

There are no Special Status plant species known within the project area. One species of concern has been found near the project site. Thick-stemmed wild cabbage (Caulanthus crassicaulis) is a Bureau Tracking Species and is on List 4 of the Oregon Natural Heritage Program because it is either rare and stable or common and declining. Mitigation is not required for this species.

CHAPTER IV: ENVIRONMENTAL CONSEQUENCES

The following effects could result from implementation of the proposed action or the no action alternative.

A. Critical Elements

1. Wilderness Study Areas

No Action Alternative: Wilderness characteristics of Rincon WSA would not be affected by this alternative.

Proposed Action: *Naturalness*: Naturalness in Rincon WSA would not be affected because the proposed exclosure would be substantially unnoticeable.

Solitude: Solitude would not be affected. Visitors to the project are would still be in a very remote area.

Primitive and Unconfined Recreation: Primitive and unconfined recreation in Rincon WSA would not be affected because of the small size of the exclosure and its location away from any of the main access routes.

Special Features: Identified special features would not be affected because they are not present at the proposed project site.

Conformance with the IMP: The proposed exclosure would in conformance with the IMP because the exclosure would be temporary and its installation would not cause surface disturbance.

2. Noxious Weeds

No Action Alternative: Selection of the no action alternative would cause no change in the current noxious weed situation.

Proposed Action: Additional noxious weeds could become introduced into the proposed project areas by soil-disturbing activities and/or wheeled vehicle use in the areas. To prevent accidental introduction of noxious weed material, all equipment used for the project should be cleaned prior to transport to the site and upon completion of the project. If noxious weeds become introduced, timely, appropriate treatments would occur in accordance with the Burns District Weed Management Plan.

B. Noncritical Elements

1. Wildlife

No Action Alternative: There should be no effects to wildlife by this alternative under the no action alternative.

Proposed Action: There should be no effects to wildlife by this alternative.

2. Recreation

No Action Alternative: There should be no effects to recreation opportunities under the no action alternative.

Proposed Action: Recreation would not be affected.

3. Visual Resources

No Action Alternative: There would be no effects to visual resources because human-made features would not be added to the landscape. VRM Class I objectives would be met.

Proposed Action: Installation of the "bull panels" would introduce short vertical and horizontal lines into the characteristic landscape. No color contrasts would be created because the gray panels would not attract attention. Texture and form contrasts would be minimal. VRM Class I objectives would be met.

4. Grazing Management

No Action Alternative: There should be no effects to grazing under the no action alternative.

Proposed Action: There should be no effects to grazing management within the area resulting from this alternative.

5. Biological Soil Crusts

No Action Alternative: There are no effects to BSCs in the study area resulting from this alternative.

Proposed Action: There are no detectable positive or negative effects on BSCs foreseen in the study area as a result of the establishment of a single exclosure for monitoring purposes. The information from this study is valuable having and may aid in the understanding of northern Great Basin BSCs and their management.

6. Soils

No Acton Alternative: There would be no effects on soils within the area as a result of the no action alternative.

Proposed Action: There would be no effects on soils within the area as a result of the preferred alternative.

7. Vegetation

No Action Alternative: There would be no effects to general vegetation under this alternative or to the thick-stemmed wild cabbage (Caulanthus crassicaulis).

Proposed Action: There would be no effects to general vegetation under this alternative or to the thick-stemmed wild cabbage (Caulanthus crassicaulis).

CHAPTER V: CUMULATIVE EFFECTS

There are no measurable cumulative effects which would result from selection of either alternative.

As the Council on Environmental Quality (CEQ), in guidance issued on June 24, 2005, points out, the "environmental analysis required under NEPA is forward-looking," and review of past actions is required only "to the extent that this review informs agency decision-making regarding the proposed action." Use of information on the effects on past action may be useful in two ways according to the CEQ guidance. One is for consideration of the proposed action's cumulative effects, and secondly as a basis for identifying the proposed action's effects.

The CEQ stated in this guidance that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." This is because a description of the current state of the environment inherently includes the effects of past actions. The CEQ guidance specifies that the "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions." Our information on the current environmental condition is more comprehensive and more accurate for establishing a useful starting point for a cumulative effects analysis, than attempting to establish such a starting point by adding up the described effects of individual past actions to some environmental baseline condition in the past that, unlike current conditions, can no longer be verified by direct examination.

The second area in which the CEQ guidance states that information on past actions may be useful is in "illuminating or predicting the direct and indirect effects of a proposed action." The usefulness of such information is limited by the fact that it is anecdotal only, and extrapolation of data from such singular experiences is not generally accepted as a reliable predictor of effects.

However, "experience with and information about past direct and indirect effects of individual past actions" have been found useful in "illuminating or predicting the effects" of the proposed action. The basis for predicting the effects of the proposed action and its alternatives is based on published empirical research and the general accumulated experience of the resource professionals in the agency with similar actions.

CHAPTER VI: CONSULTATION AND COORDINATION

A. Participating Staff

Gary Foulkes, District Planning and Environmental Coordinator
Rick Hall, Natural Resource Specialist (Botany and Special Areas)
Doug Linn, Botanist/Fuels and Forestry Specialist
Fred McDonald, Supervisory Natural Resource Specialist, Lead Preparer
Matt Obradovich, Wildlife Biologist
Lesley Richman, Range Management Specialist (Weeds)
Scott Thomas, District Archaeologist
Evelyn Treiman, Outdoor Recreation Planner
Dave Ward, Rangeland Management Specialist

B. Persons, Groups, and Agencies Consulted

Oregon Department of Fish and Wildlife
Oregon Natural Desert Association

Literature Cited

Canyonlands Field Station, Southwest Biological Science Center 2290 SW Resource.

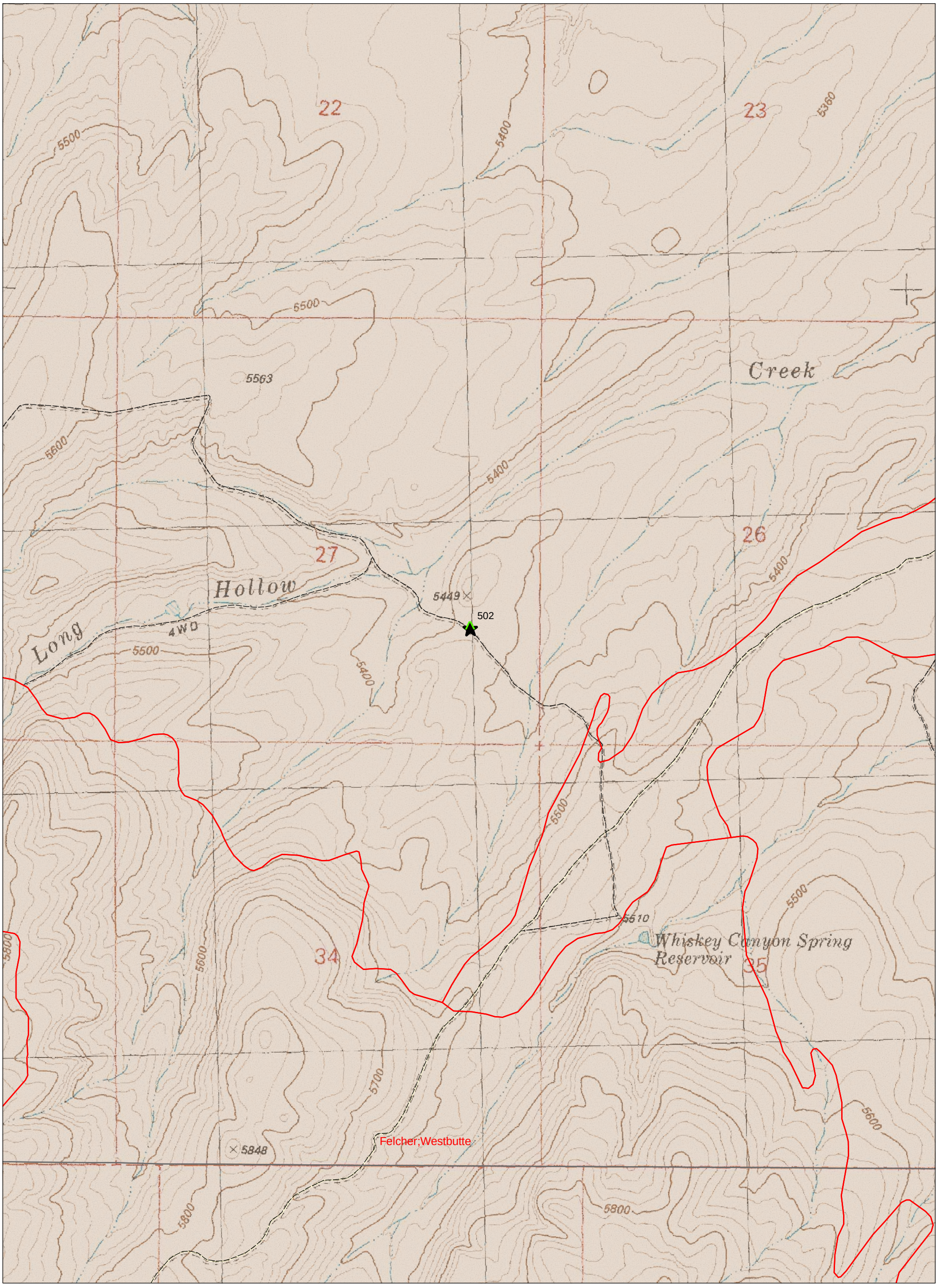
Evans, R.D. and J.R. Johansen. 1999. Microbiotic Crusts and Ecosystem Processes. Critical Reviews in Plant Science. 18(2):183-225.

Hall, F.C. 2001. Ground-based photographic monitoring. General Technical Report. PNW-GTR-503. Portland, OR; U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 340p.

Ponzetti, J.M. and B.P. McCune. 2001. Biotic Soil Crusts of Oregon's Shrub Steppe: Community Composition in Relation to Soil Chemistry, Climate, and Livestock Activity. The Bryologist 104(2):212-225.

USDI-BLM-USGS. TR-1730-2, 2001. Biological Soil Crusts: Ecology and Management. USDI, BLM Technical Reference.

Soil Crust Baseline Study - Long Hollow Creek Area



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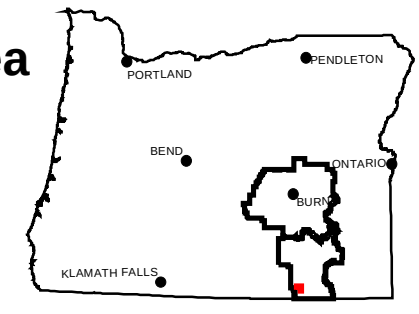
Bureau of Land Management
BLM Wilderness Study Area
BLM Wilderness
State Private
U.S. Fish and Wildlife

Soil Crust Survey Site
Soil Map Units

0 0.05 0.1 0.2 Miles

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