United States Department of the Interior

BUREAU OF LAND MANAGEMENT

100 Oregon Street
Vale, Oregon 97918-9630
http://www.or.blm.gov/Vale/

IN REPLY REFER TO:
1601, LCGMA
August 8, 2006

Dear BLM livestock permittees and Interested Publics:

I am pleased to present the Trout Creek Geographic Management Area (TCGMA) Evaluation for your review and consideration. This document summarizes the results of the TCGMA rangeland health assessment findings and presents recommendations to address related rangeland management issues.

This document ends the assessment and evaluation phase, and outlines a range of alternatives for an upcoming National Environmental Policy Act (NEPA) analysis. The decisions that can be expected to flow from the NEPA analysis are activity level decisions, rather than land use level decisions, which may be implemented in accordance with and subject to the guiding land use plan – the Southeastern Oregon Resource Management Plan and Final EIS.

We would appreciate your comments. We are particularly interested in your views on the range of alternatives and preferred alternative recommended. The team has worked diligently to involve the public and include a range of alternatives for analysis that reflect the input received thus far.

We will begin the NEPA analysis by fall of 2006. However, we want to give permittees and the interested public the opportunity to comment on the range of alternatives proposed. If you would like to comment, please do so in writing. Address your comments to the Jordan Field Manager, Vale District BLM at the address on the letterhead above. To be considered, your comments must be received in this office by September 30, 2006.

Sincerely,
/s/ Carolyn R. Freeborn
Field Manager
Jordan Resource Area

Jordan Resource Area
100 Oregon Street
Vale, Oregon 97918

August 2006

TROUT CREEK GEOGRAPHIC MANAGEMENT AREA -

STANDARDS OF RANGELAND HEALTH EVALUATION

BLM
Vale District

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

Cover Photo :
Foreground; low sagebrush rangelands in Zimmerman Allotment (1203), Trout Creek Geographic Management Area. Background; Disaster Peak and east slope of Trout Creek Mountains.

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Public Involvement Record from February 2005 through March 2006

List of Permittees and Interested Publics

Executive Summary

This is an Oregon/Washington Bureau of Land Management (BLM) Standards of Rangeland Health Evaluation that addresses 75 pastures located in Fifteen Mile Community (01201), McCormick (01202), McDermitt (01205) Zimmerman (01203), Whitehorse Butte (01206), Barren Valley (10801), Tenmile (01308), Campbell (11306), and Albisu-Alcorta (013040) grazing allotments. About 580,500 acres (94% of the total land base) is comprised of public land. This land area considered includes all of the Trout Creek Geographic Management Area (TCGMA) and four other adjoining grazing allotments. Administration occurs within Jordan Resource Area, Vale District.

Herein, BLM summarizes resource condition findings derived from long-term monitoring studies and rangeland field assessments in relation to Oregon and Washington Standards and Guidelines (S&Gs). The findings and alternative remedies considered will be analyzed in an Environmental Assessment (EA) and be used as the basis for grazing permit renewal decisions.

Public land within this region of southeastern Oregon is topographically diverse and elevation varies from about 4,500 feet near McDermitt to slightly over 8,000 feet near the upper headwaters of Oregon Canyon Creek. Rangeland plant communities present are very diverse. Upper elevations in particular support high quality natural values including intact and resilient native plant communities, special status plants and animals, productive wildlife habitat, extensive riparian areas and aspen communities, fisheries, visual resources, recreational opportunities, and various wilderness characteristics.

Since June of 1988, TCGMA grazing management has been occurring in a highly collaborative climate involving BLM staff and the *Trout Creek Mountains Working Group*; a coalition of various government agencies, environmental organizations, and grazing permittees. Riparian habitat and fisheries management issues have been the centerpiece of most management actions and ongoing grazing adjustments for more than 15 years now. Several streams in the Oregon Canyon and Trout Creek Mountains support Lahontan cutthroat trout (LCT); a native salmonid fish listed as Threatened by the US Fish and Wildlife Service (FWS) since 1991. Even though streams and wetlands do not occur within each and every pasture included in the Evaluation, riparian management considerations have either directly or indirectly influenced virtually all of the public land considered.

Aside from LCT, no other federal listed or candidate species are present.

Allotments considered in this Evaluation have received a substantial infusion of federal dollars for rangeland development projects including fences, cattleguards, spring developments, livestock water pipelines, reservoirs, wells, and rangeland seedings. Existing projects were funded by a variety of efforts including the Vale Project (1963-1974), management actions for LCT adopted in the late 1980s, wildfire rehabilitation, and hazardous fuel / weed treatments initiated after 2000.

Native and seeded rangelands at or above 5,000 feet elevation (~61% of TCGMA) support a diverse mix of rangeland plant communities and invasive plant species are confined to some road-sides or localized disturbed areas. The remaining rangelands below 5,000 feet elevation are generally much less productive and vulnerable to invasive plant influences from species including cheatgrass, annual mustards, halogeton, bur buttercup, and a variety of other weedy species.

Riparian monitoring and Proper Functioning Condition (PFC) assessment findings show generally favorable riparian habitat conditions for LCT and it is clear that a substantial amount of riparian improvement has occurred since BLM adjusted grazing management practices in the late 1980s.

Nevertheless, riparian recovery from past grazing use and other factors is still underway and some stream segments remain very susceptible to grazing impacts. A few previously undocumented riparian areas were identified during the assessment which will need to be incorporated into grazing permit renewal considerations.

It is apparent from the Bureau's upland assessment and trend data analysis that several lower elevation pastures have suffered declines in plant productivity, distribution, and vigor. Over the last 15^{+} years, the demand for livestock forage in some low elevation areas appears to be in excess of what can be produced given; (1) soil, climate, and landform characteristics and (2) riparian management considerations that must be applied in upper elevation rangeland.

Although grazing pressure was reduced in high elevation pastures from 1990 forward to reverse declining riparian condition, lower elevation rangeland grazing pressure increased over the same time period. Current livestock grazing use has been identified as a significant contributing factor in the rangeland health decline of three allotments and twelve livestock management pastures. However, BLM notes that other natural disturbance factors including drought, insects, and, in some cases, rabbits are complicating factors that exacerbate grazing impacts and affect rangeland health.

Ongoing hazardous fuel and weed suppression treatments approved in existing EAs have already set the stage for recovery and rehabilitation of some low elevation rangeland witin the McDermitt Wildland Urban Interface (WUI). However, soil and moisture conditions can be expected to naturally limit productivity in these treatment locations and expectations for livestock forage production should be tempered accordingly.

Chapter 1 – Background

A. History and Process for Assessing Rangeland Health Standards

Following the approval of revised BLM grazing regulations in 1995, BLM State Directors were assigned the task of developing state level rangeland health standards (Title 43 Code of Federal Regulations [CFR] 4180.2). The process of developing standards and defining standard indicators was done by BLM in close consultation with BLM Resource Advisory Councils (RACs). The purpose for setting standards and identifying their indicators was to provide BLM with a rational basis for determining whether current management is meeting the Fundamentals of Rangeland Health as described under 43 CFR 4180.1. See Appendix 1, Fundamentals of Rangeland Health, for a description of objectives and principles underlying BLM rangeland health standards.

On August 12, 1997, then Interior Secretary Bruce Babbitt approved the Oregon/Washington BLM Standards and Guides (S&G's) for Rangeland Health. BLM field offices in Oregon/Washington were subsequently directed to conduct field assessments in livestock grazing allotments and then use that assessment information to craft range health evaluations in relation to the state standards. These sequential Assessment and Evaluation actions were therefore used to implement 43 CFR 4180.1 and .2.

In order to accomplish this assessment and evaluation workload and conform to the need for completing work on a watershed basis, Jordan Resource Area was divided into eight land based administrative units that are referred to as Geographic Management Areas (GMAs) as shown in Map 1. Each GMA was assigned a boundary and a priority order for assessment based on the presence of resource issues such as riparian habitat, wilderness study areas, Wild and Scenic Rivers, wild horses, and special status plants or animals. GMA boundaries correspond to grazing allotment boundaries and they substantially overlap with defined watershed subunits.

The geographic boundary identification and assessment priority phase of this process was conducted with public review and comment as a key element of the Proposed Southeast Oregon Resource Management Plan (SEORMP) and Environmental Impact Statement (EIS). BLM's intent is to implement SEORMP land use plan objectives in concert with S&G evaluations.

The proposed assessment schedule and method of approach was reviewed and approved by the Southeast Oregon RAC on September 29, 1998. The sequence and location of GMA assessments has been described to the public in a BLM letter dated March 3, 1999.

Trout Creek GMA (TCGMA) is the second Evaluation to be completed in Jordan Resource Area. GMA assessments and evaluations represent a continuation of Vale BLM management oversight that has been ongoing for decades. Past assessments and evaluations were referred to as "allotment evaluations". The GMA evaluation approach allows BLM to take a hard look at the cumulative effects of proposed actions over substantially large and connected land areas.

B. BLM Obligations Prescribed Under Rangeland Health Regulations

BLM regulations require that "the authorized officer shall take appropriate action as soon as practicable but not later than the start of the next grazing year upon determining, through assessment or monitoring by experienced professionals and interdisciplinary teams, that a standard is not being achieved and that livestock are a significant contributing factor to the failure to achieve the standards and conform with the guidelines" (USDI, BLM, Standards for Rangeland Health and Guidelines for Livestock Grazing

Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington, 1997).

C. Public Involvement

BLM first disclosed the proposed sequence and methods for GMA evaluations to the public as part of the SEORMP scoping process, and therefore GMA evaluations were discussed openly and often with the public prior to the TCGMA assessment. Refer to "Summary of key public involvement events", SEORMP, Volume 1, pages 668-669.

For TCGMA, substantial consultation, cooperation, and coordination has occurred among BLM staff, livestock permittees, and the interested public. Scoping meetings for this Evaluation began in February 2005 and preliminary findings were presented to the public in spring of 2006. Refer to the *Public Involvement Record through Spring 2006* section in this document.

On numerous occasions, BLM has communicated with permittees and the general public regarding range health standards and GMA assessments by way of mailed written materials, public meetings, phone conversations, e-mails, and onsite visits. All permittees were invited to be present with BLM staff during the field Assessment and in fact many of them were able to be onsite during part of the field assessment work. Routine livestock grazing permittee meetings were used as opportunities to further discuss and clarify any issues and concerns discovered during the assessment.

BLM conferred with Malheur County Court regarding the SEORMP on six occasions between January 1996 and April 1997, and sought the Court's input in public meetings in Vale before and after the TCGMA Assessment.

D. Oregon/Washington Rangeland Health Standards

There are five Oregon/Washington BLM Standards considered in the process of determining Rangeland Health status that BLM assesses in the field with an Interdisciplinary Team (ID) of resource professionals;

- *Standard 1* – Watershed Function – Uplands: upland soils exhibit infiltration and permeability rates, moisture storage, and stability that are appropriate to soil, climate, and landform.
- *Standard 2* – Watershed Function --Riparian/wetland areas: riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and landform.
- *Standard 3* – Ecological Processes –Uplands: healthy, productive and diverse plant and animal populations and communities appropriate to soil, climate, and landform are supported by ecological processes of nutrient cycling, energy flow, and the hydrologic cycle.
- *Standard 4* – Water Quality: surface water and ground water quality, influenced by agency actions, complies with State water quality standards.
- *Standard 5* – Native, Threatened and Endangered (T&E), and Locally Important Species: habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and landform.

Whether a pasture or part of a pasture meets or does not meet each of the Standards is determined by both qualitative and quantitative means using resource "indicators". *Interpreting Indicators of Rangeland Health* (2000) is the principle technical document used by BLM Bureau-wide and Appendix 2 shows specific Oregon/Washington-Standard indicators that are considered.

E. Adaptive, Ecosystem-Based Management

Appendix 3, Ecosystem Management, and 4, Adaptive Management, explains adaptive, ecosystem-based management as prescribed in the SEORMP (existing land use plan). Both appendices should be read to gain an understanding of how different scales of assessment and management are intended to be carried out over time in Malheur and Jordan Resource Areas of Vale District.

F. Assessment and Evaluation Criteria

BLM used a variety of information sources and the professional judgment of senior staff specialists to conduct upland and riparian health assessments. The best available rangeland vegetation and soils maps were consulted for this effort and agency-approved technical references and methodologies were used, including protocols outlined in BLM Manual H-4180-1, "Rangeland Health Standards", to arrive at Determinations about range health conditions.

G. Rangeland Health Determinations

Determinations shown in Table A of this document are the Jordan Field manager's final decision as to whether or not grazing allotment pastures are meeting Standards and if livestock grazing is implicated. Pastures that failed to meet Standards related to livestock grazing are highlighted in table A and denoted with a *****. Table B summarizes all of the pastures that did not meet Standards and indicates the reason(s) why failure is believed to have occurred.

Map 5 shows all BLM "Pastures of Concern" which are locations where pastures did not meet standards regardless of whether or not livestock grazing use was implicated.

Determinations have been made after considering all of the information available to the ID Team. They represent the best synthesis of thought and analysis possible in light of scientific information as well as information provided by permittees and the interested public.

H. Expediting the TGCMA Evaluation Process

In order to expedite the Jordan Resource Area GMA Evaluation process and grazing permit renewal schedule, BLM staff accelerated and streamlined some of the assessment process steps as follows:

- Parts of the adjoining Barren Valley and Rattlesnake GMA's were evaluated in this effort.
- With the exception of certain crested wheatgrass seedings assessed in 2001, BLM staff limited quantitative field data collection to existing range trend plots.
- Due to time constraints, BLM did not characterize resource conditions within each and every plant community type within a pasture. Instead, BLM staff conducted investigations and completed field forms within predominant plant communities accessible to livestock grazing use.

I. Selection of Areas Used for Assessment Determinations

Upland and riparian areas isolated in size or occurrence that were not meeting standards, such as those typically found immediately around livestock watering facilities, were not considered to be indicative of overall range health status for the pasture. Instead, range health assessment write-ups (as well as trend plots and other long-term monitoring sites) were done in areas at reasonable distances from livestock water in order to avoid localized heavy-use or ungrazed areas that do not accurately reflect the overall impacts of grazing disturbance. Assessment determinations were made after observing as much of the area as possible by foot, vehicle, and aircraft. The "preponderance of evidence" was used to arrive at BLM Determinations.

In BLM's response to public comments concerning revised range regulations, the selection of representative areas for range health assessment was addressed:

> "The Department [of Interior] recognizes that rangelands within a given area may be in functional, healthy conditions *even though individual isolated sites do not meet the standards or guidelines*. However, the Department believes that general failure to meet the benchmarks *across a broader area*, such as a typical BLM grazing pasture or BLM allotment, would be reliable evidence that the area is not in healthy, functional condition" [italics added] (43 CFR, Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration, Vol. 60, No. 35, Wednesday, February 22, 1995).

J. Assessment Methods for Upland Sites

Existing Survey Data and Reference Areas
Current Ecological Site Inventory (ESI) data are not available for this assessment area. Ecological site potential comparisons with assessment areas were based on relatively pristine "reference" sites (referred to as "baseline" in BLM Manual H-4180-1) that have been sheltered from substantial grazing disturbance. These locations give indication of whether a like rangesite is similar to what should be reasonably expected or whether it has substantially departed from site potential.

The ID team used the best available range survey data, which were collected during the late 1970's (Oregon Automated Ecological Site Information System, or OAESIS), to assure that representative plant communities were visited and assessed in each allotment pasture. OAESIS data were based on Natural Resource Conservation Service (NRCS) standards for range site descriptions. Statewide Order IV soil surveys from 1969 were also used to help interpret observed conditions.

For each assessment site, vegetation data and observations concerning the site's physical integrity were recorded on worksheets derived from *Interpreting Indicators of Rangeland Health*, USDI, BLM Tech. Ref. 1734-6 (2000). These worksheets included *Rangeland Health Evaluation Summary*, *Ground Cover*, *Species Dominance*, and *Degree of Departure from Ecological Site Description, and/or Ecological Reference Area(s)*. The ID Team worksheets and photos taken at each assessment area are available for inspection at the Vale District Office. In the interest of streamlining the size of this Evaluation document the field worksheets and photos are not included as a part of the published Evaluation.

K. Long-Term Rangeland Monitoring (Trend) Studies

Long term upland trend studies, consisting of 100 foot line intercept transects and 3' by 3' photo plots, were re-read as part of the assessment process. Over the last several decades, these studies have been

established in Vale District in order to determine whether key upland grass species most influenced by grazing were showing evidence of basal cover increases (upward trend), decreases (downward trend), or insignificant change (trend not apparent). These monitoring methods conform to current interagency technical guidance ("Sampling Vegetation Attributes", USDI, BLM Tech. Ref. 1734-4, 1996). Trend plot and Assessment site locations are not shown spatially in this Evaluation but they may be obtained from BLM by request.

Upland vegetative trend determinations are based on several factors that influence grass vigor and reproduction. These factors include: (1) precipitation timing and amount (2) patterns of livestock use (3) permittee records submitted as actual use (numbers of livestock and number of days livestock actually grazed in a pasture) (4) annual grazing utilization surveys (5) changes visible from trend plot photos (6) changes in plant cover indicated in 3' X 3' trend plots (7) changes in plant cover under 100 foot line intercept transects (8) impacts from plant disease or insects and (9) professional judgment. Because so many short and long term factors influence plant health over time, professional judgment is appropriately applied to arrive at a final trend conclusion.

L. Riparian Trend for Proper Functioning Condition (PFC) Assessments

Riparian trend is determined by comparing current conditions with previous photos, trend studies, inventories, and any other documentation or personal knowledge existing prior to the PFC assessment. If information prior to the assessment is lacking, indicators of "apparent trend" may be deduced during the assessment process. Presence or absence of riparian/wetland species that correlate with soil moisture characteristics can be especially useful. However, care must be taken to relate these indicators to recent climatic conditions as well as management. If insufficient evidence is available to determine vegetative trend either toward PFC (upward) or away from PFC (downward), then the vegetative trend is considered to be "not apparent" (BLM, TR 1737-15, 1998, p20).

M. Water Quality Assessment

The quality of the water yielded by a watershed is determined by physical and chemical properties of the geology and soils unique to the watershed, the prevailing climate and weather patterns, current resource conditions, current land uses, and quality of management of those uses. Assessments of upland rangelands for Rangeland Health Standards 1 and 3, and riparian area assessments for Standard 2, have direct relevance to evaluation of Standard 4 (Water Quality). For streams that lack specific water quality data, the Interdisciplinary Team evaluated pertinent data from all sources available, including information gathered for Standards 1, 2, and 3, to make a final determination for the assessment of the water quality standard.

N. Information Provided to BLM for the Evaluation

During scoping, BLM invited permittees and the interested public to provide resource information that might be of use in the Evaluation and permit renewal process. Examples include historical photos, field data, general observations, and opinions based on local knowledge.

Outside of the usual information update discussions with permittees and involved government agencies (e.g. Oregon Department of Fish and Wildlife, US Fish and Wildlife Service, Nevada Department of Wildlife, Oregon Department of Environmental Quality), the only substantial new data was provided by Oregon Natural Desert Association (ONDA). ONDA has identified four areas BLM considers to be

Citizen Wilderness Proposals within the Evaluation area. See Chapter 2, section K for a brief summary of ONDA proposals.

BLM can no longer designate WSAs and does not plan on proposing any new WSAs in the context of this Evaluation. However, the EA that will be written in fall 2006 will include analyses describing potential impacts to wilderness characteristics within Citizen Wilderness Proposal areas.

O. BLM Changes to Preliminary Determinations that are Shown in this Document

Subsequent to the March preliminary assessment findings meetings, BLM became aware that the Jordan Resource Area crested wheatgrass Determinations were inconsistent with those made in Malheur Resource Area. For consistency in applying Assessment findings, Jordan Resource Area adjusted its Determinations and adopted the rationale used by the Malheur Resource Area Interdisciplinary Team.

The changes relative to the public meetings reflected in this document may be described as follows. Crested wheatgrass seedings do not automatically fail to meet Standards simply because the grass composition is made up of non-native species. Rather, crested wheatgrass is a functional plant equivalent of native grass and therefore failure would have to be based on other factors including documentation of a downward trend due to livestock grazing or missing functional/structural plant groups (shrubs and forbs) as described in agency technical references.

Seedings where this adjustment was made include: Disaster Peak Seeding North and South, Overshoe Seeding South.

Participating BLM Staff

Carolyn Freeborn – Jordan Resource Area Field Manager
* Travis Fletcher - Rangeland Management Specialist
* Cameron Rasor - Rangeland Management Specialist
Andy Bumgarner – Rangeland Management Specialist
Jon Sadowski - Wildlife Biologist
* Cynthia Tait - Fisheries Biologist
Garth Ross – Fisheries Biologist
Jack Wenderoth - Hydrologist / Soil Scientist
Jim Johnson – Wild Horse and Burro Specialist
Jean Findley – Botanist
Lynne Silva – Noxious Weeds and Invasive Plants

**Former BLM employees currently working for US Forest Service*

Chapter 2 – Description of the Existing Environment

General Overview

Chapter 2 provides a series of relatively brief general narratives about the existing environment and grazing use for the grazing allotments considered. General grazing allotment findings are described. Readers need to be aware that in fall 2006, BLM will provide substantially more detailed existing environment narratives in an EA which will fully analyze four alternative actions and how they would or would not meet Oregon/Washington Standards and Guidelines. The analysis and ROD for the EA will be used as the basis for grazing permit renewal before March of 2007.

The grazing management and rangeland development alternatives BLM will consider are described in Chapter 3 of this document. Further, Chapter 4 – BLM Recommendations for Management of the Evaluation Area and Chapter 5 – Resource Management Objectives Specific to the Evaluation Area will be addressed in the EA.

A. Climate

Climate in this semiarid area is influenced by maritime air moving east from the Pacific Ocean over the Sierra and Cascade Mountain ranges. As air masses rise to cross these mountains, moisture condenses and falls, making the air relatively dry by the time it reaches this corner of southeastern Oregon.

Average annual precipitation in TCGMA ranges between 8 and 26 inches. As recorded at the McDermitt, Nevada, weather station, most precipitation (51 percent), occurs from March through June. About 21 percent occurs from September through November and 21 percent from December through February, most of this falling as snow. Snowpack usually melts by April at elevations below 6,000 feet, with snow at higher elevations remaining until mid-June. Localized flooding often follows late winter or spring snowmelt. The amount of precipitation in any particular location within the GMA depends on topography—precipitation increases with elevation. Some precipitation occurs as thunderstorms, occasionally accompanied by hail, with isolated high-intensity, short-duration thunderstorms occurring frequently between April and October. Storms that occur July through August are typically drier with more lightning strikes than those in September or October.

Total annual precipitation in the area varies greatly by year which is shown by Crop Year (CY) precipitation data recorded between 1961 and 2002. To calculate CY precipitation, the last four months of the previous year are added to the first six months of the current year. The lowest CY precipitation occurred in 1966 (3.05 inches) while the highest was in 1984 (14.28 inches). Below average precipitation occurred during two intervals, 1988-1992 (CY precipitation = 5.95-8.63 inches) and 1999-2004 (CY precipitation = 4.55-8.47 inches), with above average precipitation occurring from 1993-1998 (CY precipitation = 9.32-11.94 inches) between the two droughty cycles.

This area also receives an abundance of sunshine and air temperatures have wide daily fluctuations. Generally, the last spring frost occurs in late May and first frost by early September. The frost-free period (temperatures above 32 ^{o}F) varies from approximately 139 days at lower elevations to 74 days at higher elevations. However, frost may occur during any month of the year.

Prevailing winds are west-southwest, with the most intense winds occurring during March and April. December and January are usually the calmest months.

B. Fire

Fire history for this area is briefly summarized here to give readers some sense of the size and frequency of substantial fires that have occurred over the last 25 years. Existing records show that 79 fires have burned a total of 56,814 acres within the Trout Creek GMA between 1980 and 2005. Fires greater than 100 acres in size include the following:

Fire Name	Year	Acres
Disaster	1980	219
Schoolhouse	1985	32,587
Angel	1985	4,476
Echave	1985	4,018
Basque	1985	473
Whitehorse	1986	2,089
Basque	1986	319
10-Mile	1987	3,151
Blue Mountain	1987	2,621
Jackson RH	1996	696
Hot Spring	1997	279
School	2000	156
Basque Station	2002	2,763
Overshoe Well	2002	431
Sage Creek	2003	493
Mules Ear	2005	1,571
	Total >>>>>>	56,342

C. Rangeland Vegetation

Native Rangelands

Due to major differences in soils, elevation, and resultant precipitation, a complex vegetative picture presents itself across the Trout Creek GMA. At the highest point in Malheur Country atop Oregon Canyon Mountains and in the associated upper elevations, significant rainfall and cooler temperatures result in a broad mosaic of low sagebrush and mountain big sagebrush communities, and a mountain shrub type composed of snowberry, bitterbrush, *Cenaothus*, and mountain big sagebrush. Grass and forb understories are associated with each of these communities, the species varying with soils and exposures. Idaho fescue, western needlegrass, bluebunch wheatgrass, and Sandberg bluegrass dominate the grass layer. Numerous inclusions of small wet meadows which dry at the onset of summer and riparian strings are found at the upper elevations, with the riparian areas often including vigorous stands of aspen and willows with associated sedges and rushes. Mountain mahogany patches across the flatter, more open expanses give a savannah-like appearance to vast stretches. Conspicuous by their absence at these higher elevations are western juniper and cheatgrass. Improper livestock grazing in portions of these communities has resulted in a loss of grass species and an increase in shrub covers on the uplands and a loss of willow, aspen, and key rushes and sedges within the riparian zone.

Dropping into the valley bottoms to the south, east, and north, a transition zone is encountered which is composed primarily of Wyoming big sagebrush, bluebunch wheatgrass, and Thurber's needlegrass

communities with a wide variety of forbs in the understory and occasional stands of basin wildrye in well-drained, rocky sites. Bitterbrush may also be found at scattered locations within these areas. Cheatgrass may be found at highly disturbed sites within this transition, and fire virtually always results in cheatgrass expansion within the burned area. Numerous steep rock faces and talus slopes with sparse to no vegetation occur at both the upper elevations and in the transition zone. Readers should refer to Map 5 which depicts the general distribution of lower elevation rangeland susceptible to influences from cheatgrass and other weedy annual plants.

The lower elevation plant associations consist predominately of a broad mosaic of salt desert shrub communities typical of the Great Basin, characterized by shallow, alkaline soils and low precipitation. These types include Wyoming big sagebrush either intermingled or in specific sagebrush/grass associations. Basin big sagebrush communities occur along deep soil drainage bottoms at these elevations and slightly into the upper elevations. In the northeast of the GMA a community of black sagebrush supports intermingled shadscale and bud sagebrush with a bottlebrush squirreltail, Sandberg bluegrass, and sparse forb understory.

Inclusions of black greasewood with occasional buffaloberry and an understory of salt grass are found north and northwest of McDermitt in the lower elevations. Most predominate, along with the Wyoming big sagebrush communities, are associations of shadscale, bug sagebrush, spiny hopsage, and horsebrush on the shallow, alkaline soils. Bottlebrush squirreltail, Sandberg bluegrass, and Thurber's needlegrass comprise the primary herbaceous understory along with sparse forbs where the communities are intact. Otherwise, a host of annual invasive species are present, including cheatgrass, bur buttercup, Russian thistle, tumblemustard, and halogeton.

Within the GMA, the lower elevation communities of both Wyoming big sagebrush and mixed salt desert shrub types are the most vulnerable to disturbance, including fire and improper grazing, with cheatgrass and all the annual invasive species, along with both green and gray rabbitbrush species, ready to move into any community significantly disturbed. Shallow soils and low rainfall, along with the rapid invasion of these exotic annuals and native invasive shrubs, are key factors in preventing recovery of these communities with their native plant components to predisturbed conditions.

Seedings and various land treatments

Crested Wheatgrass Seedings
There are approximately 80,000 acres of seeded rangeland in 28 Evaluation area pastures. Most seedings were planted with crested wheatgrass and are either legacies of the Vale Project (1963-1972) or fire rehabilitation. The 1985 Angel Canyon wildfire, for instance, was an event which burned an estimated 32,600 acres of mainly low elevation rangeland.

A high proportion of existing seedings currently support some level of sagebrush shrub canopy cover given that two and three decades of time have elapsed since they were planted. Burro Seeding, McDermitt Seeding East, High Peak Seeding, and the Fish Creek Seedings North and South are nearly pure grassland community types that failed to meet Standards because of missing functional/structural plant groups (mainly shrub cover).

Native and non-native grass seeding projects are in various stages of completion at low elevations around McDermitt. Pastures within the Evaluation area that have been seeded between 2000 and 2005 include Burro Seeding (non-native seeding), High Peak Seeding (native seeding), Lucky Seven FFR (native and non-native seeding), and McDermitt East Seeding (non-native seeding).

Chemical Brush Control Areas
(2-4d) was applied to 4 pastures during the Vale Project. With the exception of the Sheepline Brush Control Pasture (McCormick Allotment) which has been recently burned with prescribed fire, none of the chemical control areas show any lingering evidence of shrub canopy loss.

Brush Mowing
From the year 2000 forward, BLM has applied brushbeating in several low elevation pastures for the purpose of reducing fire fuels at the McDermitt wild-land urban interface.

Prescribed fire
Prescribed fire is being applied in some low elevation rangeland where cheatgrass is dominant. Fire is being used in these areas to reduce cheatgrass seed sources prior to re-seeding with native or non-native perennial grasses. See Table D for a complete listing of where native or non-native grasses are being planted following land treatment.

High elevation mountain big sagebrush types will have prescribed fire applied over about 3,300 to 4,400 acres in Oregon Canyon Mountains. About 600 of these acres have been burned to date.

Technical Review of the Vale Project

Retired former Vale BLM staff participated with BLM National Science and Technology Center personnel in a review of various historic land treatments. Part of that effort included projects that occur within the Evaluation area. Their findings were published as *A Legacy of Land Treatments* (2002). The document is available for review in the Vale District office and a copy may be downloaded off the internet at the following website: http://www.blm.gov/nstc/legacy.html.

The summary report by authors Bob Kindschy, Al Logosz, Chad McBurney, Roger Mertens, and Ed Spang offers a frank appraisal of current conditions within crested wheatgrass seedings and certain other developments established in the 1960's and 1970's. In their view, "a majority of crested wheatgrass seedings now support sagebrush stands at or near pretreatment levels and comparison of sites open to managed grazing with those sites protected from livestock left little doubt grazing use was a major contributing factor over the long term."

None of the seedings where BLM documented downward trend in this Evaluation are mentioned in the Legacy report. Generally favorable opinions about Bretz Seeding and Disaster Peak Seedings North and South disclosed in the Legacy report conform to BLM conclusions drawn in this Evaluation.

D. Noxious Weeds and Invasive Plants

Many of the lower elevations lands associated with early settlement, agricultural endeavors and travel routes are degraded and infested with a conglomerate of mostly annual noxious weeds or weedy species. The GMA has few of the more invasive noxious weeds and most of those are within the Highway 95 corridor or other vehicle travel routes.

Heavy infestations of cheatgrass (*Bromus tectorum*) are common where livestock congregate near water sources, bed grounds and salt licks as well as near the intensely used land around McDermitt, many of the

ranches and old homesteads, and historical military and freight routes. Much of this land has been historically overgrazed and possibly farmed and abandoned.

Other common annual or bi-ennial weeds associated with these areas include a variety of mustards, such as clasping pepperweed (*Lepidium perfoliatum*), tumble mustard (*Sysymbrium altissimum*), blue mustard (*Chorispora tenella*) and flixweed (*Descurainia sophia*), lambsquarter (*Chenopodium sp*.), kochia (*Kochia scoparia*), Russian thistle (*Salsola iberica*) and prickly lettuce (*Lactuca serriola*). Bur buttercup, (*Ranunculus testiculatus*) is an insidious, competitive, annual invasive that is beginning to occupy many disturbed acres, from which it then works its way into interspaces in fair to good condition land.

Russian knapweed (*Acroptilon repens*) and heart-podded and globe-podded whitetop species (*Lepidium sp*.) can be found near McDermitt, but most of it is on private land. Perennial pepperweed (*Lepidium latifolium*) and saltcedar (*Tamarix ramosissima*) are known to exist across the Nevada line. On the Oregon side, perennial pepperweed is known to be on private land near Disaster Peak. It is currently being treated in cooperation with Malheur County.

Small sites of several thistle species exist within the GMA. Scotch thistle (*Onapordum acanthium*) is often found along roadways, such as near Whitehorse turnout, and other degraded areas. Canada thistle (*Circium arvense*) and bull thistle (*Circium vulgare*) are mostly found in moister sites and meadow areas associated with riparian or ephemeral stream areas.

Halogeton (*Halogeton glomeratus*) is associated with heavily disturbed areas, road ROWs and scablands where other vegetation is lacking. While not a competitor, it easily moves into large, normally bare spaces between shrubs in salt desert communities where it doesn't thrive, but nevertheless, survives. The largest infestations of halogeton are near McDermitt and along Whitehorse road.

Resilient native plant communities associated with the higher elevation rangeland of Oregon Canyon mountains, Trout Creek mountains, and Jackson Grade are remarkably weed free from mid-slope over the top. Whitetop has moved as far up as Steens View reservoir and is moving up Jackson Grade along the road. Russian knapweed has also been treated mid-slope on Jackson Grade road.

E. Special Status Plants

Special status plant species within the Trout Creek GMA occur generally in cohorts of species within several of the many and varied habitats of the geographical area. Two species are found in the mesic habitats found in Oregon Canyon Mountains, and one species is found in alkaline conditions at lower elevations. Along McDermitt Creek, south of the Oregon Canyon Mountains and as an extension of habitat into Nevada, a string of unusual light-colored, ash soils stretch from east to west, beginning near and east of Bretz Mine at the eastern edge of the range, south to Hot Creek, which flows into McDermitt Creek, and then north to Opalite Mine. This area represents an important band that is considered the northern edge of the Basin and Range Physiographic Province, and as such, most of the rare species found here are at the northernmost edge of their global range. A few of the species extend to the unusual chalk soils of Chalk Basin along the Owyhee River near Rome. Most of the unusual soils which support special status plants in this area are privately owned. Only Bretz Mine is entirely within BLM's ownership.

None of the special status plant species in the Trout Creek GMA appear to be threatened with extirpation at this time. In spite of their rarity, populations of all species visited in the years from 2003 through 2005 appeared stable and without visible threats. Proposed mining exploration activity at Bretz Mine may pose

a threat to the population of prostrate buckwheat at that location, but mitigations to any proposed actions would benefit maintenance of that population. No impacts from livestock have been observed to date on any of the special status plant species or their habitats.

Refer to Table G for a listing of special status plants and their BLM management status.

F. Soil and Water Resources and Riparian/Wetland Areas

Water Resources

TCGMA encompasses portions of three hydrologic subbasins; the Upper Quinn, the Alvord Lake, and the Crooked-Rattlesnake. The Upper Quinn and Alvord Lake Subbasins each contain perennial flowing and interrupted perennial flowing stream systems that include fish-bearing reaches. The Crooked-Rattlesnake Subbasin within the TCGMA does not contain any perennial or interrupted perennial stream channels.

Precipitation within the TCGMA varies with orographic location and season of year. In most years the largest amount of runoff is produced from snowmelt during March through May, augmenting the existing baseflow in the main channel drainage. Snowfall in the upper reaches of the watershed may account for up to 60 percent of the precipitation with spring rains and localized high-intensity, short-duration summer thunderstorms making up the remainder. Stream-channel runoff flows and peaks coincide with snowpack melt in late winter and early spring, then diminish throughout late spring and attain near baseflow levels during the summer and early autumn, although occasional spikes and increased flow levels from summer storms must be taken into account (USGS, 1991).

Runoff amounts and upland vegetation types throughout the TCGMA watersheds are directly correlated with precipitation amounts and climatic conditions. The upper watersheds contain mountain shrub, and sagebrush-bunchgrass vegetation types that grade to salt-desert shrub, and inland saltgrass-greasewood alkali types in the low lying basin areas.

Subsurface recharge and overland flow to streams within the TCGMA are mainly from snowmelt, with peak flows and overland runoff occurring in April and tailing off by early June. By late June and early July surface flow in many streams are reduced to only base flow from perennial springs and alluvial storage discharge.

Interrupted perennial streams within the GMA are characterized by submergence and emergence of surface water along the stream length, such that flow is interrupted by dry reaches. Perennial flow in these streams usually occurs as: (1) a continuous surface flow originating within the stream channel and flowing from ¼ mile to several miles before disappearing into channel substrates; (2) a series of short, perennial flowing segments (<¼ mile); or (3) a series of perennial scour pools that receive subsurface water from alluvial fill.

Water Quality
Existing water quality data for the TCGMA has been recorded by the Oregon Department of environmental Quality and the Oregon Department of Fish and Wildlife on fourteen different streams. Data includes water temperature and flow recorded by ODF&W on six creeks and various parameters ODEQ recorded on eleven creeks**.** Four streams are on the current Section 303(d) list of the Clean Water Act; Willow Creek in the Alvord Lake Subbasin and Indian, McDermitt, and Sage creeks in the Upper Quinn Subbasin. The four streams are listed for temperature requirements while Willow Creek is also

listed for dissolved oxygen.

The Department of Environmental Quality has recently completed a Total Maximum Daily Load and Water Quality Management Plan document for the Alvord Lake Subbasin. BLM is required to complete a Water Quality Restoration Plan to comply with the findings within the ODEQ documents. BLM will incorporate the Restoration Plan as part of the environmental assessment document that addresses existing management and any proposed changes in the TCGMA that is recommended by this evaluation. Most of the streams within the TCGMA have been under intensive riparian and fisheries habitat prescriptions since 1987 when livestock grazing adjustments where implemented for stream improvement in the Oregon Canyon/Trout Creek Mountains and McDermitt Creek Basin.

Because available site-specific water quality data were limited and available for only a handful of streams in the TCGMA, assessing Rangeland Health Standard 4 (Water Quality) was conducted through evaluation of pertinent data from several sources:

1. Waterbody status, whether the stream is on the State 303(d) list (ODEQ)
2. Limitations on Beneficial Uses identified for the stream's river basin
3. Existing water quality data
4. Existing supporting data, such as range monitoring data, soil surveys, slope steepness, and aerial photography
5. Assessments for Rangeland Health Standards 1 (Watershed Function –Uplands), Standard 2 (Watershed Function –Riparian), and Standard 3 (Ecological Processes)
6. Drainage patterns
7. Land ownership within watersheds

Main Drainages of Trout Creek GMA

Upper Quinn Subbasin:

The Upper Quinn Subbasin in the TCGMA consists of McDermitt and Oregon Canyon creeks.

McDermitt Creek Watershed:

McDermitt Creek drains about 204,040 acres (319sq.mi.) into the Quinn River below McDermitt, Nevada. The McDermitt Creek watershed contains numerous perennial streams or streams that contain perennial flowing segments. The North Fork of McDermitt Creek, Sage Creek, Dry Creek, and Line Canyon tributaries to McDermitt Creek and the main stem of McDermitt Creek produce large quantities of flowing water from large perennial springs located near the headwaters of each stream. Other tributaries in the watershed contain perennial flows of lower quantities or small perennial segments that flow from north to south into McDermitt Creek. These are Turner, Payne, Cowboy, Indian, and Cottonwood creeks and their tributaries. Perennial flowing Riser Creek comes into McDermitt Creek from the south out of Nevada.

Oregon Canyon Creek Watershed:

Oregon Canyon Creek drains about 263,550 acres (412sq.mi.) into the Quinn River below McDermitt, Nevada. The Oregon Canyon Creek watershed contains only perennial streams or segments in its upper watershed and tributaries. Oregon Canyon Creek and most its tributaries are perennial flowing until water reaches the Oregon Canyon Ranch. Downstream from the ranch Oregon Canyon Creek becomes dry and all tributaries below the ranch do not contribute any flow to the creek after late spring. Oregon Canyon Creek has three large tributaries below the Oregon Canyon Ranch; Jackson, Ten Mile, and Two Mile creeks. Numerous other small tributaries to Oregon Canyon Creek drain the east face of the Oregon

Canyon Mountains and others drain the west face of Battle Mountain and other high elevation land forms east of Highway 95. Oregon Canyon Creek then flows into the Slough which then joins with the Quinn River and McDermitt Creek just downstream of McDermitt, Nevada.

Alvord Lake Subbasin:

Coyote Lake Drainage Basin

Coyote Lake is a smaller closed basin of the Alvord Lake Subbasin that is the end point for six stream systems in the TCGMA; Willow, Whitehorse, Fish, Antelope, Twelve Mile, and Dry creeks.

Whitehorse Creek Watershed:

Whitehorse Creek Watershed is located within the Coyote Lake Drainage Basin of Harney and Malheur Counties in southeastern Oregon. Coyote Lake is one of the interbasin drainage systems of the Alvord Lake Subbasin which characterizes the local geographic area of the state. Whitehorse Creek has four major tributaries; Little Whitehorse, Fifteen Mile, Doolittle, and Cottonwood creeks. This system drains about 118,500 acres (185sq.mi.) with a main channel length of X6 miles. All named tributaries within the Whitehorse Creek Watershed are either perennial or contain perennial flowing segments. Whitehorse Creek and Doolittle Creek contain smaller perennial tributaries in their headwaters.

Willow Creek Watershed:

The Willow Creek Watershed is also located within the Coyote Lake Drainage Basin and is a perennial flowing drainage system, with its headwaters emanating in the northeastern Trout Creek Mountains. Willow Creek watershed drains about 152,530 acres (238sq.mi.). The perennial flowing portion of Willow Creek drains about 65,000 acres (102sq.mi.) measured at the northern private property boundary of the Whitehorse Ranch. Located in the lower elevation of the watershed are two large warm spring/wet meadow complexes of approximately 600 total acres and one wet/meadow complex formed from beaver dams of approximately 100 acres. Willow Creek has only one perennially flowing tributary (Locally referred to as Jaw Bone Creek) which contains about 4 miles of perennial flowing channels. Annual stream baseflow for Willow Creek is derived from seeps and springs recharged from deep percolating seasonal snowmelt. Much of the remaining Willow Creek Watershed is characterized by numerous ephemeral and seasonal intermittently flowing drainage channels that empty into the mainstem of Willow Creek.

Stream-gauge records and long-term streamflow measurements are nonexistant for the Whitehorse and Willow creeks or other frontal streams that drain into the Coyote Lake basin. The nearest gaging station in the area is located just to the west of the Willow Creek Watershed on Trout Creek (a larger drainage system than Willow Creek) in Harney County. Historical records for this station can be used to give a representative comparison of annual hydrograph limb and peak flow response characteristics for Willow Creek (USGS, 1991) and other frontal stream systems. Gaging station records indicate that the baseflow in Trout Creek from August through February is quite low, less than 5.0 cubic feet per second (cfs). Ascending limbs of the hydrograph in late winter are relatively short, although rise rapidly with peak flow occurring from March through May. While the descending limb of the hydrograph falls at a slightly slower rate than the ascending limb it usually does not extend past August when historic baseflow level is obtained for the remainder of the year. It is assumed that Willow Creek roughly parallels Trout Creek flow pattern characteristics due to similar aspect, topography, climatic conditions, and proximity. This assumption is supported by historical evidence, field reconnaissance and maps.

Frontal Watersheds:

Fish Creek, Antelope Creek, Twelvemile Creek, and Dry Creek are frontal watersheds that drain the northern portion of the Oregon Canyon Mountain into the Coyote Lake Basin. All four creeks contain perennial flow in some portion of their drainages but surface water ceases to flow before each channel reaches the Whitehorse Ranch County Road except during spring runoff. Fish Creek parallels Whitehorse Creek into the Coyote Lake Basin and drains about 16,650 acre (26sq.mi.) area. Antelope Creek parallels

Fish Creek to the east and drains about 25,545 acres (40sq.mi.). To the east of Antelope Creek, Twelvemile and Dry Creeks drain about 38,830 acres (61sq.mi.) into the Coyote Lake Basin.

Crooked-Rattlesnake Subbasin:
Crooked Creek Watershed:
Crooked Creek Watershed drains a 96,000 acre (150sq.mi.) area in the northeast portion of the TCGMA. Crooked Creek in this area is an ephemeral drainage and usually only flows during spring runoff or localized summer high-intensity thunder-showers.

Riparian/Wetland Areas in TCGMA

The BLM Manual (Tech. Ref. 1737-9) defines riparian areas as ". . . a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Typical riparian areas are land along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are sites such as ephemeral streams or washes that do not have vegetation dependent upon free water in the soil." In the GMA, wetlands occur wherever the water table is usually at or near the surface, or where the land is at least seasonally covered by shallow water. This includes sloughs or scour pools, seeps, and wet meadows.

Riparian areas provide food and shelter for the animal community and are critically important to fish, birds, and other wildlife species. Riparian areas affect the quantity and quality of water for on-site and downstream water uses, such as irrigation, water for wildlife, livestock and wild horses, and recreation. Riparian areas also help store water and reduce risk of flash floods. For riparian areas to provide these benefits, they must have the plant species diversity, structure, and abundance appropriate for the area.

In TCGMA, riparian and wetland areas occur along approximately 285 miles of stream channels. Riparian vegetation, both herbaceous and woody, is found in upland meadows, at springs and seeps, and in drainage channels that vary from short, interrupted perennial systems that only flow until mid June and early July in most years to numerous perennial streams that flow for many miles.

Seep and spring areas are mainly associated with wet meadows in upper watershed areas. These seeps and springs occur in shallow soils on broad, gently sloping uplands or in dissected, rocky stream bottoms. Meadows associated with seeps and springs on upland slopes range in size from less than an acre to five or more acres, and support many herbaceous sedge and rush species.

In stream channels in upper watersheds, riparian vegetation is mostly herbaceous, but scattered pockets of woody species, such as whiplash willow and quaking aspen, are found in wetter protected areas. Positioned lower downstream are perennial stream segments that support a wider diversity of both herbaceous and woody riparian species, including cottonwood, aspen, alder, and numerous species of willow such as coyote, yellow, lemon, and whiplash. Riparian shrub and tree species are usually located in slightly steeper and rockier terrain where woody species may become established when large hydrologic events scour stream channels and allow seed establishment. At lower elevations where slopes become flatter and channels are usually wider, riparian vegetation is again dominated by sedges and rushes and willow species.

Although riparian areas and wetlands cover less than 1 percent of the GMA, their ecological significance far exceeds their limited physical area. Riparian and wetland areas are major contributors to ecosystem

productivity and structural and biological diversity, particularly in drier climates (Elmore and Beschta 1987).

Rangeland Health Standard 2: (Watershed Function - Riparian/Wetland Areas)

Proper Functioning Condition and Other Ratings

Riparian Assessment Methods
The quality of riparian productivity and diversity has been evaluated using two methods (Appendix I, Riparian/wetland Areas and Assessment Methods). One method, *long-term trend*, assesses trends in riparian health over time. The second method, *Proper Functioning Condition (PFC)*, assesses condition of riparian function, which is a result of interactions between geology, soil, water, and vegetation (USDI, BLM, TR1737-9, 1993). In general, both assessment methods address physical as well as biological attributes and their interrelationships. These attributes include the abundance, structure, and diversity of riparian vegetation and the stability of streambanks. The BLM has adopted the PFC assessment as a standard for evaluating riparian areas and will use it to supplement existing stream channel and riparian evaluations and assessments.

The PFC Rating System
The term "Proper Functioning Condition" is used to describe both the assessment process and the condition of a specific riparian/wetland area. PFC assessments provide a consistent approach that considers hydrology, vegetation, erosion, and depositional processes in the evaluation of the condition of riparian/wetland areas. A specific riparian area whose condition is designated to be "at PFC" is in a state of resiliency that will hold together during high-flow events with a high degree of reliability. Riparian areas rated PFC are also considered to be meeting Rangeland Health Standard 2 (Watershed Function—Riparian/wetland Areas).

Proper Functioning Condition assessments were conducted on approximately 285 miles of stream riparian habitat within the GMA. These stream miles were divided into lengths with similar physical characteristics that are referred to as "reaches." Reaches that were rated PFC supported the minimum amount and type of plant components needed to store water and resist bank detachment during large flow events (5-20 year return intervals). However, many reaches that were rated PFC (and meeting Rangeland Health Standard 2) still may not support the desired quantity and composition of vegetation associated with healthier, more resilient systems. For instance, in wet meadows, early- to mid-seral plants (such as Douglas sedge) are less desirable than mid- to late-seral plants (such as Nebraska sedge). In those PFC-rated riparian/wetland areas with early seral vegetation, a change in management is needed to attain desired plant composition and to improve stream channel physical conditions.

One of five possible ratings was assigned to each stream reach and wetland area:

- Proper Function Condition (PFC) = Meeting Rangeland Health Standard 2
- Functioning at Risk, Upward Trend (FARU) = Meeting Rangeland Health Standard 2
- Functioning at Risk, Trend not Apparent (FARN) = Not Meeting Rangeland Health Standard 2
- Function at Risk, Downward Trend (FARD) = Not Meeting Rangeland Health Standard 2
- Non Functioning (NF) = Not Meeting Rangeland Health Standard 2

See Appendix 5 for more information on the PFC assessment method and ratings, and refer to Table 4, Riparian PFC Summary.

PFC Assessment Results for TCGMA

Sites Rated as *Proper Functioning Condition*
Approximately 190 miles or about 67 percent of all riparian stream miles within the GMA were rated PFC. Long-term riparian trend data for these stream miles in the GMA were assembled from monumented photopoints, habitat surveys conducted between 1979 and 2005, and low level aerial photography (photographed over various years 1982 to 2004).

The long-term trend studies indicated upward trend in riparian vegetation for all streams, although the level of improvement varied between reaches. In general, substantial increases in abundance and diversity of woody (such as whiplash and coyote willows, alder, and aspen) and herbaceous (sedges and rushes) species have occurred from lower elevations to the headwaters in all streams. In most reaches, increased vegetative cover along streambanks has captured fine sediments, resulting in improved bank stabilization and channel narrowing.

Sites Rated as *Functioning at Risk, Upward Trend* (FARU)
Approximately 15 percent of all streams or about 43 miles (Table 4a) contain improving or upward conditions. The Interdisciplinary Team gave an Upward Trend rating based on abundant herbaceous and woody plant reproduction along channel banks and floodplain terraces. Presence of several age-classes of willows and aspen indicate that recruitment and expansion of woody riparian species has occurred for many years in these channels.

Sites Rated as *Functioning at Risk, Trend not Apparent* (FARN)
Approximately 15 percent of all riparian streams or about 43 miles within the GMA were rated FARN. A Functioning at Risk rating with a trend of "Not Apparent" indicates that one or more physical or vegetative attributes in that stream reach are significantly impaired. These attributes may include excessive erosion or headcutting, hydrologic heaving (hummocks) and compacted soils, bank trampling, lack of plant cover, low plant diversity or lack of reproduction, and impacts from irrigation, water developments, or roads. Although the Interdisciplinary Team determined that these reaches were Functioning at Risk, a trend rating of Not Apparent was applicable due to lack of prior baseline or long-term trend information. Most FARN ratings in the GMA resulted from livestock grazing which caused soil and bank damage and affected riparian vegetation.

All reaches with a FARN rating will be addressed by changes in management that focus on factors, such as current livestock grazing or water developments, which contribute to existing conditions**.** Many reaches will respond quickly to minor adjustments in management while others may need more intense treatment.

Twenty-three springs with wet meadows were rated FARN. Most FARN meadows were hummocked from livestock trampling and lacked plant diversity and reproduction from livestock concentration around spring troughs and headboxes. Hummocks decrease vegetative cover and increase bare soil, directly affecting potential saturation and water yield of the site.

Sites Rated as *Functioning at Risk, Downward Trend* (FARD)
Approximately 2 percent or about 6 miles within the GMA received a rating of Functioning at Risk with a Downward Trend. Five stream reaches received a FARD rating, Willow Creek reach #1 in Red Mountain North Pasture, Fish Creek reach #3 in Frenchie South Pasture, Oregon Canyon Creek reach #1 in Dry Farm South pasture, tributary reach #1 to Oregon Canyon Creek in Dry Farm South Pasture, and Mahogany Spring Draw reach #1 a tributary to Oregon Canyon Creek in Dry Farm South Pasture.

Willow Creek reach #1, upstream of private land, contains a slightly incised stream channel with sparse woody riparian species, although most of the channel contains herbaceous species along much of the distance of the reach. This reach was the main channel of Willow Creek when the Whitehorse Ranch changed the point of diversion for irrigation purposes decades ago near the Willow Creek Hot Spring. Over time this new irrigation channel became the main channel for Willow Creek bypassing the historic main channel. When livestock grazing management was changed in 1987 throughout the Trout Creek/Oregon Canyon Mountains to improve riparian and fish habitat beaver began to build dams in the new main channel of Willow Creek. Because of this the beaver dams diverted most of the flow in Willow Creek back to the historic main channel which was essentially dry for many years and not managed for riparian. Much of this reach now receives only limited stream flow throughout the year except during spring runoff.

Reach #3 in Frenchie South Pasture contains a length of severely entrenched narrow stream channel that contains riparian woody and herbaceous species. The soils in this reach are easily eroded lending to the deeply incised condition of the channel. The entrenched channel condition in reach #3 is not exhibited in the reach #2 downstream or in reach #4 upstream of reach #3.

The three reaches in Dry Creek Farm Pasture were not previously inventoried for riparian areas in 1987 when the mountains received livestock management changes. Riparian vegetation received intense livestock utilization; sedges and rushes were patchy and willows and aspen were severely hedged and lacking reproduction. This pasture will now receive prescriptions for riparian and stream channel improvement.

Sites Rated as *Non-Functioning* (NF)

Non-functioning assessment ratings were assigned to five stream reaches in five pastures covering about 3.5 miles or about 1 percent of the stream miles in the GMA. Nonfunctioning reaches occurred along Willow Creek reach #1 in Red Mountain North Pasture, one on Indian Creek reach #3 in Indian Creek Pasture, one on Cottonwood Creek reach #1 in V Pasture, one on Jaca Creek reach #1 in Jaca Seeding, and one on Fish Creek reach #1 in Angel Canyon Native.

Willow Creek, Reach #1 (historic main channel), in Red Mountain North is located on the main channel of Willow Creek. As riparian areas recovered in Willow Creek from a change in livestock management since 1989, beaver became a permanent fixture in Willow Creek building dams that divert water to new locations. Over time the main channel of Willow Creek from the Willow Butte Hot Spring and northward received increased attention from beaver which built large structures impounding large quantities of water. Some of these structures are as high as eight feet. This part of Willow Creek stream channel was originally not the main channel but an overflow channel during spring runoff. This section of channel was improved for irrigation needs for the Whitehorse Ranch decades ago to deliver water to the ranch in a straighter course, bypassing the original channel. Because spring runoff water found new pathways from the new beaver impoundments water once again flowed down the original Willow Creek course. Sometime in 1998 or 1999, the original channel remained perennial and now is the main conveyance of water northward to the ranch. Because a change in grazing schedules were prescribed in 1989 when water did not flow in the present channel this pasture was not identified as containing riparian resources. Hence the nonfunctioning rating for this reach a decade or so later.

Indian Creek reach #3 received a nonfunctioning rating because of its position immediately downstream of a tributary stream to Indian Creek and past and present influences from man. Because both Indian Creek and this tributary contain steep gradients, water is conveyed rapidly from storms and spring runoff. The stream gradient flattens immediately after these two channels join in the main channel thereby producing strong hydraulic forces that scour the channel until this energy diminishes some distance

downstream. Besides large scour events occurring in this portion of the stream other influences caused by man added to the deterioration of this reach. A temporary work camp was established on this reach during the Vale Project in a sizeable meadow that is just upstream of a road that until a few decades ago was the main access road to private ranches, private land and the top of the Trout Creek/Oregon Canyon Mountains from the town of McDermitt, Nevada.

Cottonwood Creek reach #1 is rated as nonfunctioning because of existing natural geologic conditions occurring in this portion of the channel. A massive quantity of large boulders has formed a rubble field in this reach at the confluence with Whitehorse Creek. Whether this rubble field is naturally in place or a large flow or many large flows washed these boulders to this position is not known. Immediately above this rubble field the main channel of Cottonwood Creek changes direction from flowing to the north to flowing almost directly west. This directional change may be the reason that boulders washed from upstream overtime lose energy and come to rest in a large rubble field. Numerous willows and some aspen have colonized this reach but herbaceous riparian vegetation occurs only sparsely throughout.

Jaca Creek reach #1 is rated nonfunctioning because of water being diverted from the stream for irrigation on a private parcel, dewatering this reach. Riparian vegetation in reach #1 was minimal, consisting of only scattered cottonwood trees that are quite old and decant with no new reproduction occurring.

Fish Creek reach #1 received a rating of nonfunctional because of a major washout of the channel that occurred in the 1980's and trespasses construction of a reservoir in the main channel to divert water to private land. The reach is straight, with large cobble and boulder substrates, with scattered to patchy riparian woody vegetation, and Wyoming big sagebrush, on upper edges of the streambanks. Seasonal flows pass through this reach very quickly, scouring the streambed and depositing rocky debris and disappearing into rubble braided set of channels. Livestock use in this channel has also lead to the nonfunctional rating.

Soil Resources

Soil resources found in TCGMA occur predominantly on gently sloping to rolling lava plateau uplands underlain by basaltic or rhyolitic flows and tuffs in low to mid-elevations, whereas higher elevation soils occur on gently undulating to rolling lava plateaus between very steep faulted and dissected terrain or very steep canyon lands and escarpments. Soils were surveyed and described in Oregon's Long Range Requirements for Water (1969), Appendix I-11 and I-12, Owyhee Drainage Basin and Malheur Lake Drainage Basin respectively and in the Soil Survey of Humboldt County, Nevada, East Part (2002). The GMA consists of eighty-two soil mapping units (Oregon-59 & Nevada-23) from these two soil surveys. Soil mapping units are complexes of soils that are made up of one or more soil types, known as classification units, or CUs. The GMA's fifty-nine soil mapping units in Oregon incorporate twenty-nine classification units (CU) which, in turn, have slope groups (1-6) that range between 0 and ≥60 percent slope. The twenty-three soil mapping units in Nevada incorporate 28 soil series that have slopes ranging from 0 to greater than 60 percent. Refer to listed soil surveys above for location and description of soil mapping units, CUs, and soil series in the GMA.

The majority of soils occurring at lower elevations (4,400 to 5,500 feet MSL) in the GMA consist mainly of CU 55 and CU 3 in Oregon and Colconda, Oxcorel, and Snapp in Nevada. Another unit of importance because of its alkalinity content but of lesser acreage extent is CU 45 located in the McDermitt and Coyote Lake basins.

CU 55 soils are shallow, loamy, well drained with cemented pans on very extensive to moderately steep

old fans and high terrace remnants. Soils occur usually at elevations of 4,000 to 5,500 feet and have a good potential for range seeding. Average annual precipitation ranges from 8-12 inches and mean annual air temperature centers around 46 degrees F. The soil profile consists of brownish gray gravelly loam, brown gravelly loam, to silica and lime cemented pan 6 to 20 inches thick over stratified loamy sand and gravel. Native vegetation consists of big sagebrush, low sagebrush, rabbitbrush, budsage, Atriplex spp., needlegrass, Sandberg bluegrass, and squirreltail grass.

CU 3 soils are shallow, silty, well drained underlain by gravel on nearly level recent fans and bottomland. Soils occur usually at elevations of 4,100 to 4,600 feet and have a good potential for range seeding. Average annual precipitation ranges from 8-10 inches and mean annual air temperature centers around 46 degrees F. The soil profile consists of very fine sandy loam, to silt loam to loamy gravel. Depth to gravel substratum is usually 16 inches. Native vegetation consists mostly of basin wild ryegrass, rabbitbrush, and big sagebrush.

Cu 45 soils are shallow to moderately deep, somewhat poorly drained, strongly alkaline and contain a hardpan. They occur on nearly level basin terraces and stream bottomlands. Soils occur usually at elevations of 4,000 to 4,600 feet and are poorly suited for range seeding. Average annual precipitation ranges from 8-10 inches and mean annual air temperature centers around 46 degrees F. The soil profile by depth consists of very strongly alkaline silt loam, to very strongly alkaline silt loam, over a very strongly alkaline cemented pan at 18 to 24+ inches at a depth of 18 to 40 inches. Native vegetation consists mostly of greasewood, rabbitbrush, and saltgrass.

Golconda soils are moderately deep to a durapan and well drained that formed in mixed alluvium with a mantle of loess high in volcanic ash. They occur on fan remnants and on slopes that range from 2 to 15 percent. Average annual precipitation is about 7 inches while mean annual air temperature centers around 48 degrees F. The soil profile consists of silt loam, very fine sandy loam, clay loam over a strongly cemented duripan at about 25 inches that overlies a horizon of very gravelly sandy loam. Native vegetation consists mainly of shadscale, bud sagebrush, Indian ricegrass, and bottlebrush squirreltail.

Oxcorel soils are very deep and well drained that formed in alluvium from mixed rock sources with some influence from loess. They occur on fan remnants and plateaus and on slopes that range from 2 to 30 percent. Average annual precipitation is about 7 inches while mean annual air temperature centers around 48 degrees F. The soil profile consists of gravelly very fine sandy loam, clay loam, clay, very gravelly loam, clay over gravelly clay loam. Native vegetation consists mainly of shadscale, bud sagebrush, Indian ricegrass, bottlebrush squirreltail.

Snapp soils are very deep and well drained that formed in alluvium derived from mixed rocks. They occur on fan remnants and sediments that contain slopes that range from 2 to 15 percent. Average annual precipitation is about 9 inches while mean annual air temperature centers around 48 degrees F. The soil profile consists of moderately alkaline very fine sandy loam, strongly alkaline clay loam, very strongly alkaline clay, strongly alkaline gravelly clay loam, strongly alkaline extremely gravelly loamy sand over strongly alkaline extremely gravelly loamy sand. Native vegetation consists mainly of shadscale, bud sagebrush, Indian ricegrass, and bottlebrush squirreltail.

The majority of soils occurring at mid elevations (5,500 to 6,800 feet MSL) in the GMA consist of CU 75 and CU 55 in Oregon and Devada, Genaw, and Zymans in Nevada. This elevation also contains soils CU 76 and CU 77 at a lesser extent.

CU 75 soils are loamy, shallow, very stony, well drained soils over basalt, rhyolite, or welded tuff. Unit

75 soils occur on gently undulating to rolling lava plateaus with some very steep faulted and dissected terrain. Elevations range from 4,000 to 5,800 feet. Average annual precipitation ranges from 8 to 12 inches and mean annual air temperature centers around 44 degrees F. The soil profile consists of very stony silt loam, stony loam, stony silt loam over bedrock at 15+ inches. Native vegetation consists mostly of bluebunch wheatgrass, Sandberg bluegrass, big sagebrush, and some low sagebrush.

CU 55 has been described above.

CU 76 soils are shallow, clayey, very stony, well drained soils over basalt, rhyolite, or welded tuff. They occur on gently undulating to rolling lava plateaus and some very steep faulted and dissected terrain. Soils occur at elevations from 4,500 to 6,500 feet and stones limit potential for range seeding. Average annual precipitation ranges from 8 to 12 inches, and mean annual air temperature centers around 44 degrees F. The soil profile consists of very stony, silt loam, stony silty clay, to stony and channery, heavy, silty clay loams over fractured bedrock at 18+ inches. Native vegetation consists mostly of bluebunch wheatgrass, Sandberg bluegrass, big and low sagebrush.

CU 77 soils are very shallow, very stony, rocky, well drained soils over basalt, rhyolite, or welded tuff. They occur on gently undulating to rolling lava plateaus. Soils occur at elevations from 3,500 to 6,000 feet and have no potential for range seeding due to depth to bedrock and stoniness. Average annual precipitation ranges from 8 to 11 inches, and mean annual air temperature centers around 45 degrees F. The soil profile consists of very stony gravelly loam, very stony gravelly loam over basalt bedrock at 10+ inches. Native vegetation consists mostly of low sagebrush, big sagebrush, and Sandberg bluegrass.

Devada soils are shallow and well drained that formed in residuum from volcanic rock with additions of loess and volcanic ash. They occur on plateaus, hills, and mountains and on slopes that range from 2 to 50 percent. Average annual precipitation is about 10 inches while mean annual air temperature centers around 45 degrees F. The soil profile consists of very gravelly loam, gravelly silt loam, gravelly silty clay loam, clay, clay loam over hard andesite bedrock at 17+ inches. Native vegetation consists mainly of low sagebrush, bluebunch wheatgrass, Thurber needlegrass, Canby bluegrass, and Sandberg bluegrass.

Genaw soils are shallow and well drained that formed in residuum from tuffaceous sediments mantled from loess. They occur on plateaus, hills, and mountains and on slopes that range from 2 to 30 percent. Average annual precipitation is about 9 inches while mean annual air temperature centers around 46 degrees F. The soil profile consists of silt loam, gravelly clay loam, and a very gravelly loam over highly weathered and fractured tuffaceous rock at 18+ inches. Native vegetation consists mainly of various types of Wyoming big sagebrush, spiny hopsage, Indian ricegrass, and desert needlegrass.

Zymans soils are deep and very deep and well drained that formed in residuum and colluvium from volcanic rocks with additions of loess and ash. They occur on hills, mountains, and plateaus with slopes that range from 2 to 50 percent. Average annual precipitation is about 10 inches while mean annual air temperature centers around 47 degrees F. The soil profile consists of very cobbly loam, very cobbly clay loam, very cobbly clay, clay, silty clay loam, clay over weathered volcanic bedrock at about 53+ inches. Native vegetation consists mainly of various types of big sagebrush, bluebunch wheatgrass, and Thurber needlegrass.

The majority of soils occurring at higher elevations (6,800 to 8,000 feet MSL) in the GMA consist mainly of CU 83 and CU 96 in Oregon and Cleavage, Menbo, and Ninemile in Nevada. Contained in this elevation range are soils CU 84 and CU 82 of lesser extent.

CU83 soils are shallow, very stony, well drained soils over basalt, rhyolite, or welded tuff. They occur on

gently undulating to rolling lava plateaus with some very steep faulted and dissected terrain. Soils occur at elevations mostly above 6,000 feet, but they occur as low as 5,500 feet on north slopes. Average annual precipitation is from 12 to 18 inches, and mean annual air temperature centers around 43 degrees F. The soil profile consists of very stony silt loam, stony silty clay loam, stony silty clay, over bedrock at 18+ inches. Native vegetation consists mainly of Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, low sagebrush, big sagebrush, and bitterbrush.

CU 96 (Steep rock land) is a miscellaneous land unit consisting of rough, steeply sloping areas that are predominantly shallow, very stony soils interspersed with rock outcrop. Steep rock land occurs mainly as canyons and escarpments along margins and dissected portions of lava plateaus.

CU 84 soils are shallow, very stony, rocky, well drained soils over basalt, rhyolite, or welded tuff. They occur on gently undulating to rolling plateaus and very steep canyon lands and escarpments. Soils occur at elevations mostly above 5,000 feet. Average annual precipitation is from 12 to 18 inches, and mean annual air temperature centers around 43 degrees F. The soil profile consists of very stony gravelly loam and stony gravelly loam over bedrock at 8+ inches. Native vegetation consists mainly of low sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg wheatgrass.

CU 82 soils are moderately deep, loamy, well drained soils derived from thin loess over basalt or rhyolite bedrock. They are on mostly northerly slopes on gently to very steeply sloping terrain. Soils occur at elevations from 5,800 to 8,000 feet. Average annual precipitation is from 12 to 18 inches, and mean annual air temperature centers around 43 degrees F. The soil profile consists of silt loams to stony silt loams over bedrock at 30+ inches. Native vegetation consists mainly of Idaho fescue, bluebunch wheatgrass, big sagebrush, bitterbrush, chokecherry, and snowberry.

Cleavage soils are shallow and well drained that formed in residuum or colluvium from igneous or sedimentary rock. They occur on mountains and plateaus and on slopes that range from 8 to 50 percent. Average annual precipitation is about 14 inches while mean annual air temperature centers around 43 degrees F. The soil profile consists of very cobbly loam, gravelly loam, very gravelly loam, very gravelly clay loam over hard andesite bedrock at about 16+ inches. Native vegetation consists mainly of low sagebrush, Idaho fescue, canby bluegrass, and Sandberg wheatgrass.

Menbo soils are moderately deep and well drained that formed in colluvium from volcanic rock with additions of volcanic ash. They occur on plateaus and mountains with slopes that range from 4 to 75 percent. Average annual precipitation is about 14 inches while mean annual air temperature centers around 43 degrees F. The soil profile consists of very gravelly loam, very gravelly loam, gravelly clay loam, very gravelly clay over fractured basalt at 26+ inches. Native vegetation consists mainly of mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and basin wild ryegrass.

Ninemile soils are shallow, well drained that formed in residuum from volcanic rock with admixtures of volcanic ash. They occur on plateaus, hills, and mountains and on slopes that range from 4 to 50 percent. Average annual precipitation is about 14 inches while mean annual air temperature centers around 43 degrees F. The soil profile consists of very gravelly loam, clay, gravelly clay, clay over hard rhyolite bedrock. Native vegetation consists mainly of low sagebrush, Idaho fescue, and bluebunch wheatgrass.

These soils are the majority of soil classification units by landscape elevation and comprise about 75-85 percent of the major soil components within the GMA.

Descriptions of Soil Mapping Units, Slopes, and CUs for TCGMA

Oregon

Soil Mapping Units	*Classification Units and Slopes*
1	CU 1 soils, 0-3 % slopes
1-2	CU 1 soils, 30 % CU 2 soils, 0-3 % slopes
1-15	CU 1 soils, 30 % CU 15soils, 0-3 % slopes
1-57	CU 1 soils, 30 % CU 57soils, 0-3 % slopes
2/1-2	CU 2 soils, 0-7 % slopes
3	CU 3 soils, 0-1 % slopes
3-16	CU 3 soils, 30 % CU 16 soils, 0-3 % slopes
6-57/1-2	CU 3 soils, 0-3 % slopes, 30 % CU 57 soils, 3-7 % slopes
15-31	CU 15 soils; 30 % CU 31 soils, 0-3 % slopes
15-60	CU 15 soils; 30 % CU 60 soils, 0-3 % slopes
26	CU 26 soils, 0-3 % slopes
30	CU 30 soils, 0-3 % slopes
43	CU 43 soils, 0-3 % slopes
45	CU 45 soils, 0-3 % slopes
50	CU 50 soils, 0-3 % slopes
50/1-2	CU 50 soils, 0-7 % slopes
50-16	CU 50 soils, 30 % CU 16 soils, 0-3 % slopes
50-3-1	CU 50 soils, 30 % CU 3 soils, 20 % CU 1 soils, 0-3 % slopes
55/2	CU 55 soils, 3-7 % slopes
55/2-3	CU 55 soils, 3-12 % slopes
55/3	CU 55 soils, 7-12 % slopes
55/3-4	CU 55 soils, 7-20 % slopes
55/4	CU 55 soils, 12-20 % slopes
55/4-2	CU 55 soils, 20-3 % slopes
55-50/1-2	CU 55 soils, 0-3 % slopes, 30% CU 50 soils, 3-7 % slopes
55-56/2-3	CU 55 soils, 3-7 % slopes, 30% CU 56 soils, 7-12 % slopes
55-56/3-4	CU 55 soils, 7-12 % slopes, 30% CU 56 soils, 12-20 % slopes
55-77/3-2	CU 55 soils, 7-12 % slopes, 30% CU 77 soils, 3-7 % slopes
55-79-98/3-6	CU 55 soils, 30% CU 79 soils, 20 % CU 98, 7-60 % slopes
55-98/4-6	CU 55 soils, 12-35 % slopes, 30% CU 98 soils, 35-60 % slopes
56/2	CU 56 soils, 3-7 % slopes
56/2-3	CU 56 soils, 3-12 % slopes
56/3-4	CU 56 soils, 7-20 % slopes
56-4/4-3	CU 56 soils, 12-20 % slopes, 30% CU 4 soils, 7-12 % slopes
57/1-2	CU 57 soils, 0-7 % slopes
75/2	CU 75 soils, 3-7 % slopes
75/4	CU 75 soils, 12-20 % slopes
75/5-6	CU 75 soils, 20-60 % slopes
75-55/4-5	CU 75 soils, 12-20 % slopes, 30 % CU 55 soils, 20-35 % slopes
75-76/5-6	CU 75 soils, 20-35 % slopes, 30 % CU 76 soils, 35-60 % slopes
75-77/2-3	CU 75 soils, 3-7 % slopes, 30 % CU 77 soils, 7-12 % slopes
75-77/5-6	CU 75 soils, 20-35 % slopes, 30 % CU 77 soils, 35-60 % slopes
75-96/4-6	CU 75 soils, 12-35 % slopes, 30 % CU 96 soils, 35-60 % slopes
75-96/5-6	CU 75 soils, 20-35 % slopes, 30 % CU 96 soils, 35-60 % slopes
S75-55/4-3	CU S75 soils, 12-20 % slopes, 30 % CU 55 soils, 7-12 % slopes
76/2-3	CU 76 soils, 3-12 % slopes
76-75/2-3	CU 76 soils, 3-7 % slopes, 30 % CU 75 soils, 7-12 % slopes

S76/4-5	CU S76 soils, 12-35 % slopes
77-75/4-5	CU 77 soils, 12-20 % slopes, 30 % CU 75 soils, 20-35 % slopes
77-S75/4-5	CU 77 soils, 12-20 % slopes, 30 % CU S75 soils, 20-35 % slopes
77-96/4-5-6	CU 77 soils, 12-35 % slopes, 30 % CU 96 soils, 35-60 % slopes
77-96/5-6	CU 77 soils, 20-35 % slopes, 30 % CU 96 soils, 35-35 % slopes
83-82/2-3	CU 83 soils, 3-7 % slopes, 30 % CU 82 soils, 7-12 % slopes
83-82/4	CU 83 soils, 12-20 % slopes
83-82-96/5-6	CU 83 soils, 30 % CU 82 soils, 20-35 % slopes, 20 % CU 96 soils, 35- 60 % slopes
83-84/4	CU 83 soils, 30 % CU 84, 12-20 % slopes
96/5-6	CU 96 soils, 20-60 % slopes
96-76/5-6	CU 96 soils, 30 % CU 76 soils, 20-60 % slopes
96-83-82/5-6	CU 96 soils, 30 % CU 83 soils, 20 % CU 82 soils, 20-60 % slopes

Nevada

Soil Mapping Units	*Soil Series and Associations*
262	Golconda-Snapp association
311	Harcany-Croesus-Hacwood association
335	McConnel very gravelly fine sandy loam, 0-2 % slopes
452	Kingsriver loam, 0-2 % slopes
590	Trunk-Madeline association
600	Valmy fine sandy loam, 0-2 % slopes
636	Burrita-Rubbleland-Clementine association
655	Soughe-Hoot association
665	Oxcorel-Snapp association
880	Cleavage-Sumine-Harcany association
1189	Rocconda-Soughe association
1373	Devada-Zymans association
1380	Genaw-Soughe-Rocconda association
1381	Genaw-Trunk-Devada association
1437	Rodock very sandy loam, slightly alkaline, 0-2 % slopes
1461	Ninemile-Tusel-Alyan association
1462	Ninemile-Anawalt association
1464	Ninemile-Anawalt-Sumine association
1470	Zymans-Burrita-Devada association
1472	Zymans-Burrita association
1521	Croesus-Rock outcrop complex, 8-30 % slopes
1561	Menbo-Madeline-Tusel association
1562	Menbo-Devada-LongCreek association

Microbiotic Crusts

Microbiotic crusts consist of lichens, bryophytes, algae, microfungi, cyanobacteria, and bacteria growing on or just below the soil surface (Eldridge and Greene 1994). Found in open spaces between larger plants, these crusts play a role in fixing nitrogen, filtering water, retaining soil moisture, and controlling soil erosion (Friedmann and Galun 1974; Belnap 1994). Crusts also play a role in range site resistance to invasion by weedy annual plants and noxious weeds. Vegetative cover types in the GMA that are associated with biological crust development include salt desert shrub, low sagebrush, and big sagebrush. Occurrence of crust in these cover types is directly related to elevation, precipitation, soil depth, soil texture, and interspaces between vascular plant cover. Crust is usually in greater abundance in salt-desert

shrub communities occurring in lower elevations that receive limited precipitation, and have shallow soils depths and fine soil textures.

Microbiotic crust information was recorded at one hundred and eleven TCGMA assessment sites as percentage of total vegetative cover and percentage of ground cover. Crust ranged up to categories of 31-50 percent of total vegetative cover and to 16-30 percent of ground cover throughout the GMA. The highest percentage of crust in both categories occurred in the salt-desert transition cover type found in Flattop Seeding. Refer to Rangeland Health field assessments, for microbiotic crust cover percentages for individual pastures. Because no Ecological Site Guides for microbiotic crusts exist, the cover values recorded in the GMA cannot be compared to Potential Natural Community or to microbiotic cover that existed historically (Roger Rosentreter, Botanist, BLM, Idaho State Office, pers. com., 2002).

Biological Crust, Vegetation Cover Types, Pastures, and Soils

Major vegetation cover types in TCGMA associated with biological crust development include salt desert shrub, low sagebrush, and big sagebrush. Occurrence of crusts in these cover types is directly related to elevation, precipitation, soil depth, soil texture, and interspaces between vascular plant cover. Vegetation cover types of mountain big sagebrush, mountain mahogany, and aspen supported mosses and lickens throughout the higher elevation of the Oregon Canyon Mountains.

Optimum abundance and growth conditions for biological crust is usually found in areas of low vascular plant cover, low elevations, and in shallow soils with fine textures that contain low quantities of loose surface rock or large quantities of embedded rocks (Figure 2-4, USDI, 2001). During the 2000 field season, the Jordan Field Office interdisciplinary team assessed TCGMA for upland rangeland health condition. Biological crust occurrence was recorded at one hundred and eleven assessment sites as percentage of total vegetative cover (living plant material only) and percentage of total ground cover (including bare ground and litter). Crust ranged from 1-5 percent to 31-50 percent of total vegetative cover and from 1-5 percent to 16-30 percent of ground cover throughout the GMA with almost 90 percent of the sites falling within the 1-5 percent category. Biological crust cover percentages for individual pastures are presented in the TCGMA Evaluation.

Soil texture heavily influences the species composition of biological crust communities. The more stable, fine-textured soils (such as gypsum and silt loams) support greater crust cover and more varied populations of cyanobacteria, lichens, and mosses than less stable, coarse-textured soils (Kleiner and Harper 1977; Hansen *et al.* 1999; Fig. 2-4F, USDI 2001**).** Fine-textured soils within TCGMA (TCGMA Evaluation, Chapter 2, Soil Resources) mainly consist of two classification units (55 and 77).

The effective rooting depth throughout most of TCGMA is very shallow to shallow (10-20 inches) and is limited primarily by parent material and low annual precipitation (8-12 inches). Soil chemistry is neutral to moderately alkaline with depth in most soil profiles.
Non-biotic (physical) soil surface crusts are a major structural feature in many arid regions. Their properties and manner of formation have been studied for many years, primarily because of their detrimental effects on agricultural crops. These crusts are transient soil surface layers that are structurally different from the material immediately beneath them. Physical crust can reduce water infiltration and prevent the emergence of vascular plant seedlings (USDI, 2001). This physical or rain crust layer is often harder than the rest of the soil because compounds such as salts, lime, and silica are deposited at the surface as water evaporates (Harper and Marble 1988; Johansen 1993; Ladyman and Muldavin 1996).

Total biological crust cover is inversely related to vascular plant cover, as less plant cover results in more surface area available for colonization and growth of crustal organisms. Thus, when all crust types are

combined, biological crust cover is greatest at lower, drier elevations where harsh environmental conditions limit vascular plant cover (USDI 2001). The highest percentage of crust (both as total vegetative cover and as total ground cover) in TCGMA usually occurred in the low elevation, sparsely vegetated salt desert transition cover type, which grows in shallow, fine- textured soils in areas of limited precipitation. These salt desert communities supported large amounts of lichens and mosses adjacent to shrubs and cyanobacteria in the shrub interspaces. Salt desert communities occur in numerous pastures of Fifteenmile Community Allotment in the McDermitt and Coyote Lake basins and in the White Horse Butte Allotment in the Coyote Lake Basin.

Within the TCGMA, areas above 4,500 feet MSL that receive more than 9 inches of precipitation and contain low sagebrush and big sagebrush cover types that are usually denser than salt desert shrub communities. Crust occurrence was usually lower in these areas, likely because of competition with higher density shrub cover for moisture and space. Crust cover consisting mainly of lichens and mosses ranged up to 6-15 percent of total vegetative cover and to 6-15 percent of total ground cover at most assessment sites, including the Wyoming and Mountain big sagebrush cover types.

In general, at higher elevations, greater vascular plant cover precludes crust growth (USDI 2001). In the middle and extreme eastern portions of TCGMA where elevations and precipitation (12-28 inches) are higher, crusts overall were lower in abundance compared to northern, southern, and central eastern regions. Higher elevation areas include the Oregon Canyon Mountains and areas of the Jackson Creek North and South pastures of the Fifteenmile Community Allotment. Crusts in about ninety percent of the assessment sites comprised only 1-5 percent of total vegetative and ground cover, though crusts ranged up to 5-16 percent of total vegetative cover and to 6-15 percent of ground cover at some sites. This generally lower crust abundance may be due to existing livestock grazing season-of-use, higher elevations, dense big and/or low sagebrush cover, or a combination of factors.

Landscape-Level Surface Disturbance to Biological Crust

Surface disturbance generally results in loss of species diversity, biomass, and surface cover of biological crust components. After severe disturbance, the resulting crust is generally greatly simplified from a community made up of multiple species of cyanobacteria, lichens, and mosses to a community often dominated by one or a few species of cyanobacteria (USDI 2001). When crusts are completely removed, recovery can be excessively slow, especially in areas of low effective precipitation and/or sandy soils.

Severe surface disturbance occurred in TCGMA with the conversion of native rangeland to seeded crested wheatgrass. Large portions of numerous seeded pastures were plowed or disked, then drilled and seeded with crested wheatgrass during the 1960's and after wildfires of the 70's and 80's. These mechanical activities disturbed and altered the existing biological crust composition. Over the decades, big sagebrush has recolonized parts of many seedings, which also supports some recovery of blue bunch wheatgrass, bottlebrush squirreltail grass, and Sandberg's blue grass. Abundance of biological crust varied greatly among seeded areas. Apparently some recovery of crusts has occurred in these seedings post-treatment.

Invasion of exotic annual plants into perennial plant communities can impact biological soil crusts. The Evaluation (D. Noxious Weeds and Invasive Species, page **16**) describes the present state of noxious weeds within TCGMA. In general, noxious weeds and invasive plant species are common in TCGMA, with cheatgrass being the most prevalent weedy species found. Cheatgrass occurs in varying amounts along roads and in disturbed areas throughout the GMA.

According to "Biological Soil Crusts: ecology and management" (USDI-BLM 2001), invasion of these nonnative weedy annuals into perennial plant communities can pose a long-term threat to biological soil crust, as the crust-dominated interspaces between perennial plants is often heavily invaded. Surveys in

invaded communities show rich perennial moss/lichen communities are quickly replaced with only a few species of annual mosses and cyanobacteria (Kaltenecker 1997). The mechanism by which this shift occurs is not known, but probably results from a decrease in available soil surfaces (via increased cover of live plants and litter), higher cover of plant material shading the soil surface, and/or increased fire frequency (Kaltenecker 1997; Kaltenecker *et al*.1999a; Youtie *et al*. 1999). Disturbance from livestock grazing, recreation and vehicle use can also contribute to the spread of invasive plants.

At all 111 upland vegetation assessment sites, crusts were present at varying abundances. Cheatgrass was most prevalent at elevations below 5,000 feet and no noxious weed species were observed. Wildfire, which can be the major influence for weed invasion, has occurred mostly in the lower elevation pasture in the GMA. With the current livestock grazing disturbance occurring on an annual basis, the potential for the influence or replacement of crusts by invasive or noxious weeds in the TCGMA remains a possibility.

Wild and prescribed fire can also cause widespread disturbance to soil surfaces and crust quantities. Because of the level of fire occurrence and discontinuous shrub cover in the lower elevation of the TCGMA, crusts have a limited medium for protection, recolonization, and potential for recovery. About 56,300 acres of native range have been disturbed by wildfire (TCGMA Evaluation, Chapter 2, Fire) and only one high elevation prescribed fire located in mountain big sagebrush, where crust occur naturally in low abundance, has been ignited in the unit.

Livestock Grazing and Biological Crust

In contrast to severe, widespread surface disturbances, crusts crushed in place with vehicles, foot traffic, and livestock recover much faster, especially on fine-textured soils. Crusts recover more quickly under shrub canopies than in adjacent plant interspaces (USDI-BLM 2001, Fig. 4.9; Eldridge 1996).

Crusts on all soil types are least vulnerable to disturbance when soils are frozen or snow covered. Biological crust on sandy soils is less susceptible to disturbance when moist or wet; on clay soils, when crust is dry. In general, light to moderate stocking in early- to mid-wet season is recommended (USDI-BLM 2001, Fig 2.5; Marble and Harper 1989; Memmott *et al.* 1998). Winter grazing most closely replicates the grazing strategy of native herbivores, which use more productive, higher-elevation sites during the summer and lower-elevation sites in winter. Implementation of rest/rotation strategies that minimize frequency of surface disturbance during dry seasons and maximize periods between disturbances will reduce impacts to biological crusts. Dispersal of livestock throughout useable portions of pastures would also reduce impacts. Livestock exclusion from reference areas and sites with highly erodible soils or low vascular plant cover is appropriate to protect biological crust and site stability (Fig. 5.3, USDI 2001; Miller *et al.* 1994; Burkhardt 1996).

Stocking levels and season-of-use should be ascertained on an annual basis, with optimal cover of both vascular plants and biological soil crusts as the management goal (Kaltenecker and Wicklow-Howard 1994; Kaltenecker *et al*. 1999b). Optimal plant cover should be based on site capability and rangeland health indicators of site stability and nutrient cycling (USDI-BLM 2001).

Ponzetti and McCune (2001) conducted an examination of nine shrub-steppe sites in central and eastern Oregon in order to better understand how the presence of livestock and other biotic and abiotic factors influence the abundance and distribution of soil crust organisms. They compared crusts in ungrazed livestock exclosures to adjacent grazed pastures. Some of their published findings are as follows:

- In western North America, the distribution and composition of crust communities in relation to environmental and biotic variables is poorly understood, both within and across ecosystems.

- There is conclusive evidence that total crust cover and biotic soil surface roughness were greater within the exclosures and there was more bare ground in the grazed pastures. On average, crust cover was 29% lower and soil surface roughness was 25% lower outside. Since biotic crusts are known to increase soil stability, any reduction in biotic crust cover and surface roughness increases the potential for soil loss. On average, bunchgrass cover and organic litter were 11% greater within the exclosures. Overall, we found no significant difference in vascular plant composition between grazed and ungrazed pastures, and no difference in vascular plant species richness or total cover. Since the average age since exclosure establishment is 37 years we assume there has been enough time elapsed for recovery from grazing to occur.

- We can infer from these results that, in general, biotic crusts from shrub steppe habitats in Oregon are likely to develop greater species richness if they are protected from livestock grazing. However, the magnitude of that difference and the years of protection required to realize an increase in richness remains unknown, and may vary from site to site.

- We detected clear livestock-related differences between grazed and long-ungrazed biotic crust communities, but not between vascular plant communities. Thus, biotic soil crusts demonstrated recovery after removal of grazing, despite the fact that recovery of vascular plants was not as obvious. Based on this information, we generalized that within our study region, biotic soil crust communities are more sensitive to livestock disturbance than vascular plant communities.

- Our results suggest that recent average grazing pressure at the study transects had been light to moderate, producing few or no detectable differences in plant composition. Grazing and utilization records for these sites are consistent with our belief that average grazing intensity has been light to moderate in recent years (Holechek *et al*. 1989).

- We hypothesize that total crust cover is highest on neutral to slightly acidic and on highly calcareous soils, and lowest on soils of slight to moderate calcareousness.

- The soil chemistry gradient is by far the strongest explanatory factor for the compositional differences among research sites. Other important factors include average annual temperature, elevation, and shrub cover. In the ordination of these data, the compositional effects of grazing were overwhelmed by the stronger soil chemistry and climate gradient. Thus, we detected a general pattern in biotic soil crust response to cessation of grazing, despite broad compositional, climatic and edaphic difference among research sites.

- Oregon's biological crusts appear to be more sensitive to livestock distribution than vascular plants, and there are significant differences in the cover and composition of Oregon's crusts based on regional edaphic and climatic factors.

Grazing intensity in TCGMA is "light" to "moderate" in native pastures, while seeded pastures allow utilization levels up to 60 percent. Although Ponzetti and McCune (2001) indicated that livestock disturbance impacts biological crust cover, crusts are found throughout TCGMA. During the 2002-2005 field seasons, the interdisciplinary team observed only one area devoid of crusts, but did record numerous pastures that contained crusts in discontinuous or small isolated patches. The distribution and composition of crust communities in relation to physical and biotic variables is poorly understood, both within and across ecosystems.

Studies concerning the impacts of disturbance on biological crusts cover a large range of climatic zones, soil types, and levels of disturbance. Because standards for measuring crust recovery are currently

lacking, it is not surprising that in the literature recovery rates from disturbance have ranged widely (2 to more than 3,800 years), and either appear to show no pattern or often appear contradictory (Anderson *et al.* 1982; Callison *et al.* 1985; Jeffries and Klopatek 1987; Cole 1990; Belnap 1995, 1996; Belnap and Warren 1998).

Water and Wind Erosion

Biological soil crusts are effective in reducing wind and water erosion of soil surfaces, and crust cover loss significantly increases water erosion of both coarse- and fine-textured soils (McKenna-Neumann *et al.* 1996; Belnap and Gillette 1997, 1998). Wind can be a major erosive force in deserts, as sparse vegetation leaves large patches of soil unprotected by plant litter or vegetative cover (Goudie 1978). Increased sediment production and movement are a direct result of disturbance and removal of biological crusts. The impact of biological soil crust on hydrological cycles can be highly variable and can result from a combination of site, soil, and crust factors. However, lack of standardized data collection methods and descriptions of soil, biological crust, and climatic characteristics at study sites makes comparison of research results difficult (USDI BLM 2001).

The potential for wind and water erosion in TCGMA is low due to rolling terrain, soil surface textures, and where shrub cover is present. The interdisciplinary team found only one pasture (Pronghorn Pasture in the Fifteenmile Allotment) with indications of wind erosion. Recovery from disturbance by all types of biological crust components is faster in fine-textured soils than in coarse-textured soils, as fine-textured soils are often stabilized by chemical and rain crusts and retain soil surface moisture longer (as reviewed in Harper and Marble 1988; Johansen 1993; Ladyman and Muldavin 1996). Recovery of wind resistance at some sites is also more rapid in fine-textured soils, probably due to physical or rain crust formation after rainfall. Silty soils show a 50% recovery of wind resistance to erosion after a single large rain event.

Soil resources in TCGMA were assessed in the Evaluation for basic physical functions, including Soil/Site Stability (capacity to limit redistribution and loss of soil resources, including nutrients and organic matter, by wind and water), Hydrologic Function (capacity to capture, store, and safely release water, to resist a reduction in this capacity, and to recover this capacity following degradation), and Integrity of the Biotic Community (capacity to support functional and structural communities, to resist losses due to disturbance, and to recover following disturbance). All of these functions relate directly or indirectly to biological crust cover, either as a deterrent to wind and water erosion or as a component of an intact biological community.

At each assessment site, all indicators were compared to indicators obtained at relatively pristine reference areas. Existing ecological site descriptions (vegetation composition and percent cover for that site) were reviewed for consistency with the soils and vegetation found at the area of interest. Unfortunately, no Ecological Site Guides for biological crusts existed during the 2000 field season, and site guides for crust are still not available (Mike G. Karl, Rangeland Ecologist, BLM, National Science and Technology Center, pers. com., 2004). Therefore, the percentages of biological crust cover recorded for TCGMA cannot at present be compared to Potential Natural Community or to crust cover that existed historically. Additionally, "Biological Soil Crust: Ecology and Management" (USDI-BLM 2001), was not available for reference during the 2000 field season when these sites were inventoried. Since that time, resource personnel in Jordan Field Office have obtained this technical reference and have attended training on biological crusts specifically utilizing this technical reference.

Assessment results for Soil/Site Stability and Hydrological Function showed that, in general, uplands in TCGMA had extremely stable soil surfaces with few signs of wind or water erosion, or sediment movement. All TCGMA pastures met Rangeland Standard 1 and overall, most soil, hydrologic, and biotic characteristics (including presence of invasive weeds) departed only slightly from reference sites and

ecological site descriptions. Soil site stability and hydrological function indicators for rills, water flow patterns, pedestals and/or terracettes, gullies, wind scour, and litter movement suggested that soils are extremely stable throughout the upland rangelands. Of the one hundred and eleven assessment sites that were rated for soil and hydrologic function only16 sites rated a departure from a **"**None to Slight" rating established for Ecological Reference Areas ratings for these indicators. Most of the site departures from the "none to slight" ratings were in the "slight to moderate" with only three rated in the "medium" category for liter movement. The three site were located in the Pronghorn, Basgue Seeding West, and Burro Seeding pastures

One of the chief indicators of soil erosion and sedimentation is water flow patterns. During field assessment, the interdisciplinary team found 12 sites the contained ratings of slight to moderate for water patterns. The team concluded that most of these site ratings can be contributed to two localized high-intensity, short-duration summer thunderstorms that followed roughly the same directional pattern through this group of pastures. Usually water flowing overland will move surface litter and loose sediment into small debris accumulations near the base of larger woody litter, bunch grasses, shrubs, and rocks. Lack of flow patterns and erosion is indicative of gently sloping landforms, generally good vegetative cover, soil rock content, and absence of moderate to heavy compacted soils.

Nitrogen and Biological Crust

Nitrogen concentrations are known to be low in desert soils compared to other ecosystems. Cyanobacteria and cyanolichens can be an important source of fixed nitrogen for plants and soils in desert ecosystems. Nitrogen fixation is highly dependent on past and present water and light regimes, as well as species composition. Fixation rates are highest after photosynthesis has replenished lichen carbon stores. For most lichen species, nitrogen-fixation rates increase with temperature to 25°C, given sufficient moisture. Since nitrogen-fixation rates depend on the cover of specific crust species, the timing, extent, and type of past disturbance are also critical factors. Still, rates are expected to vary greatly, depending on the species present and environmental conditions. Nitrogen released from crustal organisms is readily taken up by surrounding vascular plants, fungi, and bacteria. Vascular plants growing in biologically crusted soils show higher tissue concentrations of nitrogen than plants grown in uncrusted soils. As with carbon, crusts contribute nitrogen to soils both under plants and in plant interspaces, thereby counteracting the tendency of these nutrients to concentrate around perennial plants (USDI-BLM 2001).

Mechanical disturbance, such as trampling from livestock grazing and off-road vehicle use can result in large decreases in soil nitrogen through a combination of reduced input and elevated losses. In all soils tested, disturbances by vehicles, human foot traffic, mountain bikes, and raking immediately reduces nitrogen input from crusts (25 to 40% on silty soils [the majority of TCGMA soils], 76 to 89% on sandy soils). In silty loam soil, researchers have shown a 64% reduction of nitrogen fixation in burned areas, 85 to 94% reduction in grazed areas, and 99% reduction in tilled area. Decreased nitrogen inputs from crusts can have long-term impacts on soil nitrogen levels. In one study, 50% less nitrogen occurred in grazed soils compared to adjacent ungrazed soils (USDI-BLM 2001).

G. Fish and Aquatic Habitat

Five native fish species occur in TCGMA streams and include Lahontan cutthroat trout (LCT), Lahontan redside shiner, specked dace, Tahoe sucker, and mountain sucker. Three of these species have special status designations, LCT are Federally listed as Threatened. Tahoe suckers and Lahontan redside shiners, are on the BLM's special status species list as a Bureau Assessment species.

Three nonnative fish species, rainbow trout, brown trout, and brook trout, have been introduced within the Quinn River subbasin. Currently, brown trout and brook trout are primarily found in McDermitt Creek. Rainbow trout inhabit livestock reservoirs within the TCGMA.

Lahontan Cutthroat Trout

LCT occupied allotments and pastures are depicted on Map 6. The Lahontan cutthroat trout is an inland cutthroat subspecies endemic to the physiographic Lahontan Basin of northern Nevada, eastern California, and southern Oregon. It was listed by the USFWS as Endangered in 1970 (Federal Register Vol. 35, p. 13520) and subsequently reclassified as Threatened in 1975 (Federal Register Vol. 40, p. 29864).

Historically, LCT were found throughout the Quinn River drainage in McDermitt, Oregon Canyon, and Tenmile creeks, but introduction of nonnative rainbow trout has hybridized the cutthroat, and pure LCT persist only in upper tributaries of McDermitt Creek. The McDermitt Creek system consists of the main-stem McDermitt Creek and several tributary streams, including Line Canyon, Sage, Indian, Cottonwood, Riser, and Corral Canyon creeks. Pastures currently supporting LCT are shown on Map 6.

Amphibians and Aquatic Reptiles in TCGMA

No special status amphibians have been documented from TCGMA. The Pacific treefrog is abundant and well distributed along GMA streams, breeding in side channels, sloughs, and pools. Western spadefoot toads are also abundant and often co-occur with treefrogs. Wandering garter snakes are found near water at reservoirs and along GMA streams such as Willow and McDermitt creeks.

Aquatic Invertebrates in TCGMA

Invertebrate samples collected in TCGMA streams between 1985 and 1993 were dominated by species, such as midges, baetid mayflies, net-spinning caddisflies, riffle beetles, or blackflies, which are tolerant of sedimentation and warm water temperatures. However, the occurrence of clean water species (e.g. stoneflies, free-living caddisflies, heptageniid mayflies) at most sites indicated that fairly good water quality and clean rubble substrates were present. The relative abundance of these species tended to increase in upstream sites.

Overview of Aquatic Habitat Conditions

There are about 140 miles of fishbearing waters within the TCGMA.

COYOTE LAKE BASIN WATERSHED

Willow Creek

When consultation with USFWS was initiated in the early 1990s, this reach was not considered LCT habitat by ODFW or USFWS. However, improved conditions upstream, have led to higher water tables and adult LCT have recently been recorded in Willow Creek below the county road.

Whitehorse Creek

Whitehorse Creek flows in a confined canyon through much its length. Tributaries include Little Whitehorse, Fifteenmile, Doolittle, Cottonwood, and Sheepline creeks. ODFW fish surveys in 2005 observed high LCT abundances in the main Whitehorse Creek and in the headwaters (Fig. Y). Instream pool habitat has also improved since 1992.

Little Whitehorse Creek

Little Whitehorse Creek is a productive LCT stream. Approximately 4.5 stream miles are within livestock exclosures, one of which was built in 1972 and is the oldest exclosure in TCGMA. Four riparian monitoring sites were established on Little Whitehorse Creek in the 1980s, two of which are now inside exclosures. All show steady improvement of riparian and streambank conditions.

Doolittle Creek

Doolittle Creek is a small stream with dry reaches during periods of low flow. Beaver ponds occur near the headwaters but are not currently active. During drought in the early 1990s, these ponds supported large adult trout even during periods of low flow. The 1994 fish survey found fewer than 300 adult LCT in Doolittle Creek; in 2005, three sites were inventoried but no LCT were observed.

Fifteenmile Creek

LCT are found only in the first 800 meters of Fifteenmile Creek due to a 4 meter rock barrier preventing fish passage above this reach. Habitat below the barrier is dominated by beaver ponds and riffles, with dense riparian vegetation consisting of rose, willow, and dogwood. LCT were observed in beaver ponds in this reach in 1994 and 2005. One riparian monitoring site established upstream on Fifteenmile Creek in the 1980s has documented steady improvement of riparian and streambank conditions.

Cottonwood Creek

This tributary to Whitehorse Creek has a barrier and is dry in the lower reaches at low flow, and was originally fishless. LCT from Willow and Whitehorse creeks were planted above the barrier in 1971 and 1980 and persist upstream; high fish densities were recorded below the headwater spring in 2005 (ODFW, unpubl. data). Riparian monitoring in upper Cottonwood Creek has documented increases in herbaceous cover and willow reproduction.

Antelope, Twelvemile Creek, Dry Creek, and Fish Creek

These streams are among those that drain north from the Oregon Canyon Mountains into Coyote Lake basin, but are not part of the Willow/Whitehorse system. Except for Antelope Creek, they are not fishbearing, but are intermittent with perennial reaches. LCT from Whitehorse Creek were planted in Antelope Creek in 1972, and have established in a 1 mile perennial reach. Although LCT were sighted in 2001 by BLM personnel, no fish were observed during ODFW surveys in 2005.

QUINN RIVER WATERSHED

McDermitt Creek

McDermitt Creek flows into the Quinn River system and arises from persistent snow fields and related springs on the east slopes of the Trout Creek Mountains at an elevation of 7,600 feet.

Sage Creek

Sage Creek originates at 7,800 feet elevation on the eastern flank of Trout Creek Mountain from a series of snowbank-fed springs and flows east for about 10.5 miles before joining McDermitt Creek. Although historic grazing practices prior to 1985 caused deterioration of riparian resources and hydrologic function in Sage Creek basin, riparian restoration has occurred under current livestock management.

Line Canyon Creek

A tributary of Sage Creek, Line Canyon Creek also originates on the east slope of Trout Creek Mountain, at an elevation of 6,960 feet. The stream is approximately 3 miles in length, most of the stream provides good fish habitat and is the primary refuge for pure LCT in the McDermitt watershed.

In 1999, NDOW estimated the number of LCT in Line Canyon Creek to be about 463 fish per mile, an increase from past years attributable to improved riparian management and cessation of drought.

Indian Creek
Indian Creek is a tributary of McDermitt Creek with headwaters located at 7,500 feet on the southern slope of the Oregon Canyon Mountains. The upper two and a half miles of the stream is perennial, and transplanted cutthroat/rainbow hybrids are present.

Mine, Payne, and Cottonwood Creek
These streams are among several tributaries to McDermitt Creek which are small, intermittent, and drain from the north. When flows are sufficient they are fishbearing, primarily speckled dace and suckers.

H. Terrestrial Wildlife and Wildlife Habitat

Trout Creek Geographic Management Area supports the most diverse assemblage of wildlife species and habitats found in Jordan Resource Area. For management purposes, ten different wildlife habitat types are recognized including; (1) playas and salt desert wetlands (2) black greasewood / buffaloberry bottomlands (3) mixed salt desert / basin big sagebrush (4) Wyoming big sagebrush (5) low sagebrush (6) mountain big sagebrush (7) mixed mountain shrubs (8) large canyons and steep rock faces (9) riparian areas, and (10) seeded non-native rangelands.

Terrestrial wildlife habitat Determinations for Standard 5 shown in table A are based on plant community composition, structure, and distribution considerations as stated in the SEORMP ROD and BLM Technical Note 417. The Determinations are supported with various data including field notes, digital images, upland trend plots, and professional judgment. Refer to Appendix 6 for a description of how and why terrestrial wildlife Determinations are made for this Evaluation.

Based on the best available records there are 147 species of terrestrial vertebrates (reptiles, birds, and mammals) and 8 species of fish present. See Table D for a complete vertebrate list including the species of management importance. The Objectives Chapter of this document identifies wildlife species and habitat associations that will be considered in the EA following the Evaluation. TCGMA exists as a highly complex landform and plant community patchwork. Habitat transitions and mixed upland plant community types are abundant and so are the variety of habitat niches available for wildlife occupation. Given these habitat conditions it is not a surprise that TCGMA supports so many different species of animals compared to most of Malheur County.

There are no terrestrial species present listed as Threatened or Endangered under the federal Endangered Species Act. Neither are there any federal candidate species residing within the Evaluation area. Kit fox (Oregon State Threatened) occupy lowland mixed salt desert habitats north of the Oregon Canyon Mountains often referred to as the Whitehorse Desert.

This Evaluation area is an important greater sage-grouse production area for eastern Oregon. Year 2005 aerial surveys indicate there are 70 leks (centers of breeding activity) within the Assessment area boundary. ODFW reports an upward sage-grouse population trend in the hunter district that overlaps with this Evaluation.

Allotments and pastures that support sage-grouse leks are as follows;

Allotment	Pastures and Number of Greater Sage-grouse Leks per Pasture	GMA Name	Total Number of Leks
15 Mile Community Allotment	Jackson Creek North (7#), Blue Mountain (5#), Greenponds (5#), V (2#), Dry Creek (1#), Cascade Brush Control (1#), Jackson Creek South (1#)	Trout Creek GMA	22
Barren Valley Allotment	Threeman Butte Well (1#) and South (1#)	Barren Valley GMA	2
Whitehorse Butte Allotment	15 Mile (13#) and Willow (6#)	Trout Creek GMA	19
Zimmerman Allotment	Turner (9#), Dry Creek (4#), Homestead (3#), Disaster Peak Seeding South (2#), Pinky (1#)	Trout Creek GMA	19
McCormick Allotment	Cash Canyon (4#), Indian Creek (2#), Bretz Seeding (1#), Deafenbaugh Riparian (1#)	Trout Creek GMA	8

Habitats at or above 5,000 feet elevation are typically made up of communities with a mix of shrub species and canopy cover types supporting diverse herbaceous understories of native grasses and desirable forbs. Habitats below 5,000 feet, shown on Map 5, tend to support a weak native grass and native forb understory and they are highly susceptible to invasive annual plant influences. At these lower elevations big sagebrush and big sagebrush / salt desert mix habitats fall into two broad categories; (1) communities that already have highly altered ecological processes from invasive annual plants or (2) communities that have a relatively minor and patchy annual invasive presence but they are at risk from becoming dominated by invasive plants if they sustain intense surface disturbance events or fire.

By far, big sagebrush community habitat variations are the dominant plant cover in this area. As such, a great deal of the EA that analyzes alternative management options will address the current status of big sagebrush types and how they compare to the Desired Range of Future Conditions (DRFC) prescribed in the SEORMP ROD. BLM estimates that about 429,300 to 464,100 acres of TCGMA are comprised of big sagebrush range-sites and about 49,300 of those acres (about 10.6% - 11.5% of all TCGMA big sagebrush types) are currently in a grassland status due to fire or land treatment. For Evaluation and management purposes TCGMA has been assigned a 15% allowable grassland disturbance threshold as part of the SEORMP ROD (see ROD page *x*).

The most productive and desirable big sagebrush wildlife habitats are comprised of mid to late maturity shrub stands with a complex herbaceous understory comprised of native forbs and grasses (consistent with range site capabilities). TCGMA Wyoming, mountain, and basin big sagebrush rangelands illustrate how relatively dense shrub canopy cover (20%to 30% or more) and diverse herbaceous plant understories coexist in the same location where proper grazing stewardship is practiced and site potential allows. BLM noted numerous examples in most of the allotments assessed where such favorable wildlife habitat attributes of plant composition and structure exist. However, it is important to recognize that even sagebrush communities with relatively weak native understories will continue to support a number of important wildlife life history requirements. This is because in spite of less than optimal understory conditions, shrublands as defined in the ROD (classes 3,4, and 5) still provide important habitat elements including forage, structure, and cover used for wildlife security, escape, and thermal relief.

This is not to say that BLM desires to attain weakened sagebrush understory conditions. What it does mean, however, is that given the option, a weakened shrub community is preferable to shrub steppe habitats with little or no available shrub cover. This contrast is a fundamental premise of shrubland management for wildlife under the SEORMP ROD.

Very few wildlife escape ramps (bird ladders) are currently installed in the 200 $^{+}$ livestock water troughs of this Evaluation area. BLM needs to remedy this situation to mitigate potential wildlife entrapment in livestock water troughs.

Conifer and juniper woodland habitats are absent in TCGMA but a mix of mountain shrub species are present that provide high quality forage, cover, structure, and security for wildlife use. These communities are scattered throughout nearly all mid to upper elevations, mainly above 5,000 feet.

Riparian and wetland habitats are highly diverse and well distributed within this land area. See riparian and wetland chapters of this document for a description of existing conditions.

Livestock grazing and impacts on forage demand for big game does not appear to be an issue needing resolution in the Evaluation area. Big game species present within the Evaluation area include California bighorn sheep, pronghorn, and Rocky Mountain mule deer.

BLM has other supporting information pertinent to the Evaluation area that are not included in this document. This supporting information includes raw shrub cover field data collected in seedings, contract survey data collected for pygmy rabbits, reptiles and landbirds, landbird monitoring data within mountain big sagebrush burn areas. The information can be examined at the Vale District office.

I. Wild Horses

TCGMA is influenced by the Coyote Lakes Herd Management Area (HMA) which occupies a 194,992 acre land area. The HMA borders Sheepshead HMA on the north, follows the Burns District boundary to the southwest to T38S R36E, angles northwest along the Whitehorse Road to Crooked Creek, and runs north to T33S R40E, south of Burns Junction.

The Alvord-Tule Springs Herd Management Area Plan (HMAP) identified cross over between the HMAs in February 1985. Based on this, census/gather removal operations are being coordinated between the Vale and Burns Districts from this time forward to avoid inaccurate census and inefficiency in gather operations due to migration.

Adult horses in the HMA weigh an average of 950 to 1150 pounds and stand between 14.2 and 15.2 hands, with some stallions being slightly larger. The dominate colors are sorrel, bay, and black with a few pintos and buckskins. Characteristics of the herds have remained the same since 1975.

Wild horses used Red Mountain North Pasture in 1971 and have continued that use since the original inventories though not originally identified as part of the Coyote Lakes HMA. The South Eastern Oregon Resource Management Plan included Red Mountain North as a part of the Coyote Lakes HMA increasing the total acreage from 167,919 to 194,992.
Willow Creek, located in Red Mountain North pasture, is the only natural late season water source for the Coyote Lakes HMA. This is supplemented by the Long Draw Pipeline and a private well on the Whitehorse Ranch. The Whitehorse Ranch at times pumps water for the benefit of the horses and to

reduce the impacts to the Willow Creek riparian area during the hot season and fall, even when domestic livestock are not present.

Forage is allocated for 125 to 250 horses in the Coyote Lakes HMA or 3,000 animal unit months (AUMs.)

J. Rangeland/Grazing Use

General Overview
Information pertaining to rangeland grazing use is briefly described in this section. Upland trend data are summarized for permittees and the interested public in Table F.

In the interest of streamlining this document BLM did not include certain types of information such as livestock actual use and utilization records and rangeland development project inspections. The information related to these subjects is available to the public upon request.

Public Land Grazing Preference

Permittee	Total Preference	Active Preference	Suspended Preference	Allotment
John Albisu	405	405	0	Albisu-Alcorta
GJ Livestock	601	601	0	
Richard Yturriondobeitia	204	204	0	Barren Valley
Unallocated	664	664	0	Ten Mile
GJ Livestock	173	173	0	McDermitt Creek
Whitehorse Ranch LLC	10,978	9,287	1,691	Whitehorse Butte
Zimmerman Family Limited Partnership	9,575	7,342	2,233	Zimmerman
GJ Livestock	8,862	6,301	2,561	McCormick
Richard Yturriondobeitia	2,029	2,029	0	Fifteen Mile Community
David Etchart	2,584	2,584	0	
Mike Harry/Lucky 7 Ranch	5,591	5,591	0	
Tree Top Ranches LP	10,366	10,366	0	
Cleto Muguira	390	390	0	

(a) Albisu-Alcorta Allotment (#01304)

Background
The Albisu-Alcorta Allotment is 14,904 total acres located two miles north east of McDermitt Nevada in T.40S and T.41S., R.43E. The allotment is divided into four pastures which are authorized to be grazed from March 16 to October 15. GJ Livestock and John Albisu graze their livestock in common on the allotment. The allotment has an Allotment Management Plan (AMP) which has not been followed in the past. The Southeastern Oregon Resource Management Plan and Record of Decision (RMP) of 2002 indicated an active authorization of 1,006 AUMs for Albisu-Alcorta Allotment.

Overview
Uplands located within the higher elevations of the Albisu-Alcorta Allotment currently support an ecologically functioning vegetative community with diverse structure and composition of perennial grasses, forbs and shrubs. Uplands located within the lower elevations show a loss of functional and structural groups and have shifted to annual plant communities. Impacts to uplands due to livestock grazing were localized, very limited in extent, and were not detrimental to ecological function and sustainability of the existing vegetative communities.

Assessment data showed that Andy Fife, Upper Lazy T, and Lower Lazy T Pastures in the Albisu-Alcorta Allotment were not meeting Rangeland Health Standard 3 due to invasive annual plants. The Breaks Pasture, which is located at a higher elevation did meet Rangeland Health Standard 3. Due to wildland fire annual plants now occupy a substantial part of the pastures not meeting standard 3 and have significantly altered the ecological processes of the native plant communities. See Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
Permitted grazing use within the Albisu-Alcorta Allotment is not consistent with the Albisu-Alcorta AMP (1974). The current grazing system builds some plant phenology deferment into the four pasture rotation which is generally grazed from March 16 thru August 31.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the Albisu-Alcorta allotment annually since 1966. The data has been collected for all the pastures individually except for the Lazy T Pasture. The Lazy T Pasture is split into the Upper and Lower Lazy T Pastures but the data has always been recorded as if the pastures were one.

(b) Ten Mile Allotment (#01308)

Background
The Ten Mile Allotment is 3,634 total acres located ¾ of a mile north east of McDermitt Nevada in T.41S R.43E. The allotment is one pasture which has a grazing season from March 16 to June 15. The allotment was broadcast seeded to crested wheatgrass in 1952 as a means to control halogeton. However, due to the method of seeding and the large populations of jackrabbits the seeding was not very successful. The Ten Mile allotment is currently unallocated. In the past it has been used by various local Permittees in order to provide needed rest in other pastures that they would normally use. The allotment does not have an Allotment Management Plan (AMP). The Southeastern Oregon Resource Management Plan and Record of Decision (RMP) of 2002 indicated an active authorization of 664 AUMs for Ten Mile Allotment.

Overview
Over all the uplands located within the Ten Mile Allotment show a loss of the native perennial bunchgrass functional and structural group. The northern half of the pasture has a stand of crested wheatgrass along with the shrub, forb, and crust components. The southern half is dominated by annuals and is missing all of the functional and structural groups.

Assessment data showed that the Ten Mile Allotment was not meeting Rangeland Health Standard 3. The cumulative impacts of many different types of disturbances have led to the overall decline in rangeland vigor and productivity. Annual plants now occupy approximately one half of the pasture and have significantly altered the ecological processes of the native plant communities. See Table A (S&Gs

Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
The Ten Mile Allotment is currently unallocated and in the past has been used on an as needed basis by various local Permittees who have had the need to rest other pastures generally allocated to them. The permitted grazing use within the Ten Mile Allotment is authorized during the critical growing period every year, March 16 through June 15.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the Ten Mile allotment annually since 1965.

(c) Barren Valley Allotment (#10801)

Background
The Barren Valley Allotment is 12,912 total acres located 35 miles north west of McDermitt Nevada in T.36S, R.38E. and R.39E. Richard Yturriondobeitia is authorized to graze livestock in the allotment. The allotment is divided into three pastures which are authorized to be grazed from November 1 to December 31 and March 1 to March 31. The allotment has an Allotment Management Plan (AMP) which has been followed. The Southeastern Oregon Resource Management Plan and Record of Decision (RMP) of 2002 indicated an active authorization of 204 AUMs for the Barren Valley Allotment.

Overview
Over all the uplands located within the Barren Valley Allotment show a loss of the native perennial bunchgrass functional and structural group. The eastern half of the Gap Pasture is missing all of the functional structural groups. The western half of the Gap Pasture and the other two pastures contain various amounts of the shrub, forb, and crust components. Impacts to uplands due to livestock grazing were localized, very limited in extent, and were not detrimental to ecological function and sustainability of the existing vegetative communities.

Assessment data showed that The Gap, Three Man Butte Well, and 12 Mile Ridge Pastures in the Barren Valley Allotment were not meeting Rangeland Health Standard 3. The abundance of annual plants and the lack of native perennial bunchgrass plants have significantly altered the ecological processes of the native plant communities causing the pastures not to meet standard 3. See Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
Permitted grazing use within the Barren Valley Allotment is consistent with the Barren Valley AMP (1984). The current grazing system is winter use only and is typically grazed from November 1 to March 31. However, the AMP allows grazing to occur from October 15 to March 31 with the flexibility to graze until April 15. This flexibility provides deferment when needed in the 15 Mile Community Allotment which the permittee uses in conjunction with the Barren Valley Allotment.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the Barren Valley allotment annually since 1987. The data has been collected for all the pastures individually except for the Gap Pasture. The Gap Pasture was created in 2002 when the Three Man Butte Pasture burned and was rehabilitated. A fence was constructed to protect the rehabilitation project from livestock grazing and split the Three Man Butte Pasture in two.

(d) McDermitt Creek Allotment (#01205)

Background
The McDermitt Creek Allotment is 4,907 total acres located 4 miles west of McDermitt Nevada in T.47N, R.36E. and R.37E. The allotment lies within the state of Nevada. GJ Livestock is authorized to graze cattle in the allotment. The allotment is one pasture and is authorized to be grazed from February 15 to May 15 for a total of 173 AUMs. The allotment does not have an Allotment Management Plan (AMP).

Overview
The uplands located within the McDermitt Allotment show a loss of the native perennial bunchgrass functional and structural group. Most of the allotment lies below 5,000 ft elevation and is very dry with sodic soils which now support annual plant communities. Impacts to uplands due to livestock grazing were localized, very limited in extent, and were not detrimental to ecological function and sustainability of the existing vegetative communities.

Assessment data showed that the McDermitt Allotment was not meeting Rangeland Health Standard 3. Invasive annul plants now occupy a substantial part of the pasture and have significantly altered the ecological processes of the native plant communities. See Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
The current grazing system is winter/spring use and is typically grazed from February 15 to May 15.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the McDermitt Creek allotment annually since 1990.

(e) McCormick Allotment (#01202)

Background
The McCormick Creek Allotment is 58,886 total acres located 4 miles west of McDermitt Nevada in T.40S, T.41S and R.39E, R.40E, R.41E, and R.42E. GJ Livestock is authorized to graze cattle in the allotment. The allotment is divided into eight pastures and is authorized to be grazed from March 15 to December 31. The allotment does not have an Allotment Management Plan (AMP). The Southeastern Oregon Resource Management Plan and Record of Decision (RMP) of 2002 indicated an active authorization of 6,301 AUMs and 2,561 suspended AUMs.

Overview
The uplands located within the Deafenbaugh Riparian and Flat Top Seeding Pastures show a lack of native perennial bunchgrass functional and structural group. Most of the uplands located within the pastures lie below 5,000 ft elevation. Impacts to uplands due to livestock grazing were localized, very limited in extent, and were not detrimental to ecological function and sustainability of the existing vegetative communities.

Assessment data showed that the Deafenbaugh Riparian and Flat Top Seeding Pastures were not meeting Rangeland Health Standard 3. The cumulative impacts of many different types of disturbances have led to the overall decline in rangeland vigor and productivity. Invasive annul plants now occupy a substantial part of the pasture and have significantly altered the ecological processes of the native plant communities. Standards 2, 4, and 5 in the Payne Creek Pasture are not meeting due to livestock grazing. See Chapter 5,

Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
The current grazing system is dictated by elevation, riparian values, and Lahontan Cutthroat Trout habitat present in pastures within the allotment. The authorized use period is March 15 to December 31, however, the permittee normally chooses to remove most of the cattle by the end of August. The cattle start grazing in the lower elevations of the allotment and are moved to higher elevation pastures as the snow melts and the vegetation matures.

Since 1990 the Indian Creek, Cash Canyon, Sheepline Bruch Control East and West pastures have been managed for riparian values and fish habitat. It was originally thought that the Indian Creek Pasture supported the native Lahontan Cutthroat Trout which is a species listed by the U.S. Fish and Wildlife Service (USFWS) as threatened. It has since been discovered that the trout in the Indian Creek Pasture are a hybridized population and not a pure stain of LCT.

The Sheepline Bruch Control East and West Pastures contain the headwaters of Fifteenmile, Doolittle, and Sheepline Canyon Creeks that have Lahontan Cutthroat Trout residents in downstream areas. The USFWS has issued a Biological Opinion dictating that the Sheepline Bruch Control East and West Pastures would be grazed from May 15 to July 15 for two consecutive years followed by two consecutive years of rest. The Indian Creek Pasture would be grazed for no more than sixty days during April 15 to July 15 time frame. Along with section 7 consultation with the USFWS these pastures have typically been grazed during the period of June 15 to August 15 depending on annual climatic conditions. Willows produce most of their growth during the month of August therefore, this system allows for minimal use on willows from the cattle and maximum willow growth.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the McCormick Allotment annually since 1979, however, for this evaluation process the data from 1990 through present will be used. The data collected from 1990 through present represents what has been happening since riparian management has been implemented.

(f) Zimmerman Allotment (#01203)

Background
The Zimmerman Allotment is 51,835 total acres located 16 miles west of McDermitt Nevada in T.40S. and T.41S., R.38E., R.39E., and R.40E. Zimmerman Family Limited Partnership is authorized to graze cattle in the allotment. The allotment is made up of eleven pastures which have a grazing season from April 1 to November 30. The allotment does not have an Allotment Management Plan (AMP). The authorized use in the allotment is 7,342 active AUMs and 2,233 suspended AUMs.

Overview
Over all, the uplands located within the Zimmerman Allotment have all structural and functional groups present. The ecological processes of the native plant communities are intact and functioning well. Impacts to uplands due to livestock grazing were localized, very limited in extent, and were not detrimental to ecological function and sustainability of the existing vegetative communities.

Assessment data showed that the Zimmerman Allotment is meeting Rangeland Health Standard 3 for all pastures within the allotment. See Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
The current grazing system for the Zimmerman Allotment is dictated by elevation, riparian values, and Lahontan Cutthroat Trout habitat present in pastures within the allotment. The authorized use period is April 1 to November 30. The permittee runs yearling cattle instead of cow calf pairs. He normally chooses to remove most of the yearlings by the middle of August. The yearlings start grazing in the lower elevations of the allotment and are moved to higher elevation pastures as the snow melts and the vegetation matures.

Since 1990 the Dry Creek, Turner, and Disaster Peak Native Pastures have been managed for riparian values and fish habitat. The Dry Creek and Disaster Peak Native Pastures support the native Lahontan Cutthroat Trout which is a species listed by the USFWS as threatened.

The USFWS has issued a Biological Opinion dictating that the Dry Creek and Disaster Peak Native Pastures would be grazed from May 1 to July 15 for one year followed by two consecutive years of rest. Along with section 7 consultation with the USFWS these pastures have typically been grazed during the period of May 1 to August 15 depending on annual climatic conditions. Willows produce most of their growth during the month of August, therefore, this system allows for minimal use on willows from the cattle and maximum willow growth.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the Zimmerman allotment annually since 1979, however, for this evaluation process the data from 1990 through present will be used. The data collected from 1990 through present represents what has been happening since riparian management has been implemented.

(g) Whitehorse Butte Allotment (#01206)

Background
The Whitehorse Butte Allotment is 134,476 total acres located approximately 20 miles north west of McDermitt Nevada in T.36S., T.37S., T.38S., T.39S., and T.40S. and R.37E., R.38E., and R.39E. Whitehorse Ranch LLC is authorized to graze cattle in the allotment. The allotment is made up of ten pastures which have a grazing season from March 16 to August 31. The allotment has an Allotment Management Plan (AMP) set up with a deferred rotation grazing system which has been followed in the past. The Southeastern Oregon Resource Management Plan and Record of Decision (RMP) of 2002 indicated an authorization of 9,287 active AUMs and 1,691 suspended AUMs.

Overview
Uplands located within the higher elevations of the Whitehorse Butte Allotment currently support an ecologically functioning vegetative community with diverse structure and composition of perennial grasses, forbs and shrubs. Uplands located within the lower elevations (5,000 ft and below) show a loss of functional and structural groups and have shifted to annual plant communities.

Assessment data showed that the Buckskin Seeding, Fish Creek North and South, Frenchie South, Red Mountain North and South, Willow Butte Seeding, and Whitehorse Seeding of the Whitehorse Butte Allotment are not meeting Rangeland Health Standard 3. The cumulative impacts of many different types of disturbances have led to the overall decline in rangeland vigor and productivity. Invasive annul plants now occupy a substantial part of the pastures and have significantly altered the ecological processes of the native plant communities. See Chapter 5, Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
The current grazing system for the Whitehorse Butte Allotment is dictated by elevation, riparian values, and Lahontan Cutthroat Trout habitat present in pastures within the allotment. The authorized use period is March 16 to August 31. The permittee runs two different herds of cattle. One herd rotates through 4 pastures and the other herd rotates through 6 pastures during the grazing season. The cattle start grazing in the lower elevations of the allotment and are moved to higher elevation pastures as the snow melts and the vegetation matures.

Since 1990 the Willow Creek, Red Mountain South, and 15-Mile Pastures have been managed for riparian values and fish habitat. The Willow Creek, Red Mountain South, and 15-Mile Pastures support native Lahontan Cutthroat Trout which is a species listed by the USFWS as threatened.

The USFWS has issued a Biological Opinion dictating that the Willow Creek and 15-Mile Pastures would be grazed from May 1 to June 30 every other year. Each pasture receives one year of use followed by one year of rest. The Biological Opinion set the grazing schedule for Red Mountain South as March 16 to April 30 every year. Along with section 7 consultation with the USFWS Willow Creek and 15-Mile Pastures have typically been grazed during the period of May 1 to August 1 and Red Mountain South from March 16 to May 15 depending on annual climatic conditions. Willows produce most of their growth during the month of August, therefore, this system allows for minimal use on willows from the cattle and maximum willow growth.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the Whitehorse Butte allotment annually since 1979, however, for this evaluation process the data from 1990 through present will be used. The data collected from 1990 through present represents what has been happening since riparian management has been implemented.

(h) Fifteen Mile Community Allotment (#01201)

Background
The Fifteen Mile Community Allotment is 312,307 total acres located approximately 1 mile north west of McDermitt Nevada in T.36S., T.37S., T.38S., T.39S., T.40S. and T.41S. and R.39E., R.40E., R.41E. and T.42S. Richard Yturriondobeitia, David Etchart, Mike Harry/Lucky 7 Ranch, Tree Top Ranches LP, and Cleto Muguira are authorized to graze cattle in the allotment. The allotment is made up of 35 pastures which have a grazing season from March 1 to October 31. The allotment does not have an Allotment Management Plan (AMP). The Southeastern Oregon Resource Management Plan and Record of Decision (RMP) of 2002 indicated an authorization of 21,146 active AUMs.

Overview
Uplands located within the higher elevations of the Fifteen Mile Community Allotment currently support an ecologically functioning vegetative community with diverse structure and composition of perennial grasses, forbs and shrubs. Uplands located within the lower elevations (5,000 ft and below) show a loss of functional and structural groups and have shifted to annual plant communities.

Assessment data showed that the Basque Seeding East and West, Burro Seeding, Cascade Brush Control, Etchart Seeding, Jackson Creek North and South, McDermitt Seeding East and West, Oregon Canyon Brush Control, Oregon Canyon Seeding East and West, Overshoe Seeding North and South, Pronghorn, Schoolhouse Seeding East and West, and 12-Mile Seeding Pastures of the Fifteen Mile Allotment are not meeting Rangeland Health Standard 3. The cumulative impacts of many different types of disturbances have led to the overall decline in rangeland vigor and productivity. Invasive annul plants now occupy a substantial part of the pastures and have significantly altered the ecological processes of the native plant

communities. See Table A (S&Gs Determination Summary by Allotment and Pasture) and Table B (Factors Contributing S&Gs Failure by Allotment and Pasture) for specific assessment results for each pasture.

Current Grazing System
The current grazing system for the Fifteen Mile Community Allotment is dictated by elevation, riparian values, and Lahontan Cutthroat Trout habitat present in pastures within the allotment. The authorized use period is March 1 to October 31. The five permittees run together in some pastures and individually in other pastures. The cattle start grazing in the lower elevations of the allotment and are moved to higher elevation pastures as the snow melts and the vegetation matures. After July 15 the cattle move back down into lower elevation pastures to end the grazing season.

Since 1990 the Whitehorse, Dry Creek, V, and Green Ponds Pastures have been managed for riparian values and fish habitat. The Dry Creek, V, and Green Ponds Pastures support native Lahontan Cutthroat Trout which is a species listed by the USFWS as Threatened.

The USFWS has issued a Biological Opinion dictating that the Whitehorse, Dry Creek, V, and Green Ponds Pastures would be grazed from May 15 to July 15 for two consecutive years followed by two consecutive years of rest. Along with section 7 consultation with the USFWS Whitehorse, Dry Creek, V, and Green Ponds Pastures have typically been grazed during the period of May 1 to August 15 depending on annual climatic conditions. Willows produce most of their growth during the month of August, therefore, this system allows for minimal use on willows from the cattle and maximum willow growth.

Summary of Actual Livestock Use and Utilization Data
Actual use and Utilization Data has been collected for the Fifteen Mile Community allotment annually since 1979, however, for this evaluation process the data from 1990 through present will be used. The data collected from 1990 through present represents what has been happening since riparian management has been implemented.

K. ACEC/RNAs

Three areas of critical environment concern (ACECs) have been designated in the GMA, all of which are also research natural areas (RNAs). Dry Creek Bench ACEC/RNA is the largest with 1,616 acres designated to protect two mountain mahogany plant community types identified in the Oregon Natural Heritage Plan (ONHP) (Oregon Natural Heritage Advisory Council, 1998). Mendi Gore Playa ACEC/RNA comprises 148 acres in two separate parcels, the smaller of which supports the relevant and important value of a winterfat community and the larger of which represents a black sagebrush community, both of which are vegetative cells identified in the ONHP. The smallest ACEC/RNA is Little Whitehorse Creek Exclosure at 58 acres. Its relevant and important values include three vegetative cells identified in the ONHP, as well as the presence of Lahontan cutthroat trout, a Federally-listed threatened species. These ACEC/RNAs were designated with the signing of the SEORMP/ROD in 2002, and a complete description of each area, including a description of each relevant and important value, and specific management relative to each ACEC/RNA, are described in the SEORMP/ROD on pages 68 to 102.

L. Wilderness Study Areas (WSAs)

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BLM Wilderness Study Areas

Overlap between BLM WSAs (including BLM recommended suitable and unsuitable) and grazing allotments is as follows;

BLM WSAs	BLM Grazing Allotment	Grazing Pasture(s) Overlap
Disaster Peak	Whitehorse Butte	Willow
	Zimmerman	Dry Creek, Turner, Disaster Peak native
Bowden Hills	15 Mile Community	Pronghorn
Twelvemile Creek	Whitehorse Butte	Frenchie South
	15 Mile Community	Greenponds, Oregon Canyon Brush Control
Oregon Canyon	McCormick	Deafenbaugh Riparian, Indian Creek, Payne Creek
	15 Mile Community	Etchart Seeding
Wilow Creek	Whitehorse Butte	Willow, 15 Mile
15 Mile	15 Mile Community	V, Whitehorse, Jug Spring, Dry Creek, Luscher, Greenponds
	Whitehorse Butte	15 Mile
	McCormick	Sheepline Brush Control

Citizen Wilderness Proposals

Based on 2003 field observations, Oregon Natural Desert Association (ONDA) has provided four Citizen Wilderness Proposals within the Evaluation area boundary (see Map 4 and ONDA web page onda.org). Two proposals are located east of state Highway 95 and they include; Tenmile Creek (72,606 acres) and Battle Mountain (62,479 acres) units. The document which identifies these units was received by Vale BLM in February of 2004. Two other proposals are located near the Burns/Vale District border and they include Black Point (81,454 acres) and Tule Springs Rim (22,975 acres). The document identifying the existence of these units was the TCGMA scoping letter provided by ONDA to BLM in March of 2005.

Grazing allotments and pastures that overlap with ONDA proposals are as follows:

Citizen Wilderness Proposal Name	BLM Grazing Allotment Overlap	Grazing Pasture(s) Overlap
Tenmile Creek	15 Mile Community	Jackson Creek North, Burro Seeding
	Albisu-Alcorta	The Breaks, Andy Fife
Battle Mountain	15 Mile Community	Jackson Creek North
Black Point	Whitehorse Butte	Red Mountain North, Red Mountain South, Buckskin Seeding
Tule Springs Rim	Whitehorse Butte	Red Mountain North

Chapter 3 – Proposed Management Alternatives

Brief Alternatives Overview

Prior to livestock turnout in March 2007, BLM will analyze the environmental consequences of four different management alternatives for the Evaluation area including continuation of existing grazing management practices and three alternative options. The alternatives will consider an array of rangeland development options as well as different levels of authorized grazing use including seasons of use and AUMs authorized. Potential AUM differences by alternative will not be shown in this Evaluation, but they will be clearly identified in the EA that will be written by fall 2006. The Record of Decision for the EA will establish the terms and conditions for grazing permit renewal in all Evaluation area allotments.

The alternatives are described here very briefly as an overview so permittees and the interested public may understand the general nature of each potential management option. In the pages immediately following this overview, BLM provides much more detail associated with each alternative and readers will need to refer to various Evaluation Maps, Tables, and Appendices to gain a full understanding of the proposals. Each of the alternatives assume BLM would complete land treatment projects already approved in existing prescribed fire and Wildland/Urban Interface (WUI) related EAs.

- ***Alternative 1*** considers the highest level of rangeland project development proposed by BLM permittees. This alternative would change the timing and sequence of grazing use in several high elevation pastures supporting LCT from two years of grazing use and two years of rest to one year of grazing use followed by one year of rest. Further, grazing use in these LCT pastures would be shifted forward 2 weeks later in the summer and a 20% increase in average livestock actual use would be allowed. Lower elevation rangeland would be grazed periodically with occasional rest or deferment, but emphasis would be placed upon use during occurring the active growing period (March 15 through May 15).

- ***Alternative 2 (No Action Alternative – Continuation of Existing Management)*** considers a relatively small number of new rangeland development projects, mainly for the benefit of LCT habitat conservation, and the consequences of continuing grazing management as it has occurred over the last 15 years.

- ***Alternative 3 (Proposed Action)*** considers acceptance of some selected rangeland development projects proposed by permittees and BLM preferred grazing systems. This alternative would change the timing and sequence of grazing use in 15 Mile Community and Whitehorse Butte Allotment pastures supporting LCT identical to Alternative 1. Although grazing use in these pastures would be shifted forward 2 weeks later in the summer, livestock average actual use would remain the same as under current management. Lower elevation rangeland would be grazed periodically with occasional rest or deferment, but emphasis would be placed upon use during the active growing period (March 15 through May 15).

- ***Alternative 4*** considers acceptance of a limited number rangeland development projects and an emphasis on protection of natural values. This alternative would change the timing and sequence of grazing use in the 15 Mile Community and Whitehorse Butte pastures supporting LCT identical to Alternatives 1 and 3. However, average livestock actual use in upper elevation LCT pastures of 15 Mile Community and Whitehorse Butte Allotments would be decreased by 20%. Further, instead of emphasizing active growing period grazing use (March 15 through May 15) with occasional rest or deferment in lower elevation rangelands, this alternative would emphasize late fall or winter use (November 1 to March 15) and require lowered average actual use if grazing occurs during the active growing period.

Detailed Alternative Descriptions

Alternative 1

BLM management actions would conform to criteria directed by the 2002 Southeastern Oregon Resource Management Plan Record of Decision (SEORMP ROD) instead of the 1984 Southern Malheur Rangeland Program Summary (RPS) and associated planning documents.

BLM would accept all permittee range development project proposals shown in Table C.

The sequence of summer livestock grazing use in 15 Mile Community Allotment (V, Greenponds, and Dry Creek Pastures) and Whitehorse Butte Allotment (Willow and Fifteenmile Pastures) upper elevation pastures supporting LCT would change from two consecutive years of grazing use and two consecutive years of rest under existing management to one year of grazing use followed by one year of rest [1]. BLM would allow livestock average actual use in these pastures to increase by 20%.

The timing of summer livestock grazing use in the pastures described above would also change compared to existing management. Livestock would be turned into V or Greenponds pastures on June 1st and be allowed to stay until July 31st instead of turning in on May 15th and staying until July 15th under existing management. Livestock would be turned into Willow or Fifteenmile pastures on June 1st and be allowed to stay until July 31st instead of turning in on May 1st and staying until June 30th under existing management.

BLM would also consider allowing permittees the possibility of grazing livestock for a total of 75 days in 15 Mile Community (V and Greenponds Pastures) and Whitehorse Butte Allotment (Willow and Fifteenmile Pastures) instead of only 60 days under current management. Grazing extension to mid-August would only be allowed to occur under exceptionally wet climatic conditions. In wet years, upland livestock forage production may become especially abundant and the potential for herbaceous plant regrowth in riparian areas after grazing use may also be favorable due to prolonged and elevated stream flow.

Authorized grazing use on lower elevation LCT habitat in Willow Creek (Whitehorse Butte Allotment, Red Mountain South Pasture) would be reduced compared to existing management. BLM would allow annual grazing use between April 1st and May 15th (45 days) instead of the annual use from March 16th to May 15th (60 days) authorized in an amendment to the FWS Biological Opinion (2004).

Grazing use in Zimmerman Allotment pastures that support LCT would not change.

BLM would allow construction of a ¼ to ½ mile east/west drift fence in Red Mountain North Pasture of Whitehorse Butte Allotment to deter livestock movement north. The fence would be built in a way that would continue to allow wild horse access to water sources in Red Mountain North Pasture.

BLM would corridor fence Willow Creek in Red Mountain North Pasture to protect and recover LCT habitat north of the Whitehorse Road. Construction would include a water gap so livestock and wild horses would continue to have access to drinking water.

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[1] Sheepline Brush Control Pasture (McCormick Allotment), and Whitehorse, and Jug Springs Pastures (15 Mile Community Allotment) do not support LCT within the pasture boundary. However, upland and riparian conditions within these pastures can be expected to indirectly influence LCT habitat and populations downstream.

Restoration or repair of springs would occur where resource conditions warrant action.

Indian Creek in McCormick Allotment would continue to be managed for riparian habitat values. However, LCT management concerns are no longer an issue for BLM in this location because the resident fish population is hybridized and they are therefore no longer a part of the existing LCT Recovery Plan.

BLM would reduce the length of selected water gaps created by riparian exclosures already in place on Little Whitehorse Creek (Whitehorse Butte Allotment, 15 Mile Pasture) and remove selected riparian exclosures already in place on Willow Creek (Whitehorse Butte Allotment, Red Mountain South, and Willow Pastures).

Tenmile Allotment would continue to provide livestock forage for permittees demonstrating the greatest need for livestock AUMs. Under current management, no single permittee has been assigned the AUMs available in Tenmile Allotment.

BLM would sub-divide Angel Canyon Native pasture with three new east/.west fence segments. About one to two miles of new fence would be required. Following fence construction, the north end would be used exclusively by David Etchart, the middle portion would be used exclusively by Cleto Maguira, and the southern end would be used exclusively Lucky 7 Ranch. The proposed fence construction would be located in the Oregon Canyon WSA.

BLM would allow construction of a ¼ mile gap fence in Disaster Peak Native Pasture of Zimmerman Allotment to deter drift of livestock from grazing allotments in Nevada. The proposed fence is located in the Disaster Peak WSA.

Approved fire fuels and weed treatment projects already analyzed in EA OR-030-99-009 *McDermitt Complex Restoration / Rehab, and Noxious Weed Control Project* and EA OR-030-00-008 *Southern Trout Creeks Habitat Maintenance, Prescribed Burn* would be allowed because BLM Decisions on these actions have already been issued. The projects authorized within the Evaluation area are highlighted in yellow in Table D.

Under Alternative 1 BLM would allow for repeated brush mowing maintenance, once or twice every five to ten years, in selected pastures and areas within pastures including the following: 15 Mile Community Allotment - *Basque Seeding West, Etchart Seeding, McDermitt Seeding West* and McCormick Allotment - *Flat Top Seeding*. Repeated brush mowing over time would be allowed in order to emphasize long term grass production in some parts of pastures while maintaining shrub canopy cover sufficient to support wildlife needs in others. Existing management does not allow for such re-treatment without additional environmental analyses.

BLM would allow chemical control of rabbitbrush with 2-4d or other approved compounds if and when the current Oregon pesticide injunction is resolved. Allowable chemical treatment areas would be confined to brush beaten areas of the following pastures; Etchart Seeding, and Flattop Seeding.

Some low elevation cheatgrass dominated areas near McDermitt would be open to late season TNR forage allocation on a case by case basis provided the following conditions exist: (1) climatic conditions have resulted in exceptionally high volume cheatgrass production (2) residual grass cover following authorized use is adequate to protect soils from accelerated erosion. Also see page 59-60 of the SEORMP ROD for other resource management criteria that would need to be met before TNR would be authorized.

BLM would not allow Temporary Non-Renewable (TNR) grazing use on native rangeland in order to protect natural values including intact native plant communities, special status plants and animals, wildlife habitat, riparian areas, visual resources, recreational opportunities, and various wilderness characteristics [2].

High intensity grazing or mechanical treatment of rank, standing crested wheatgrass (wolf plants) would be authorized periodically if necessary to restore plant vigor and productivity. This treatment would be authorized if it can be clearly demonstrated with utilization and trend plot studies that crested wheatgrass plant health would not be compromised.

BLM would seed crested wheatgrass and/or other adapted perennial plants along low elevation roads or other highly disturbed locations (such as old water haul sites or salting areas) to reduce the incidence and spread of invasive plants. Where necessary to accomplish the same task above 5,000 feet elevation, BLM would seed exclusively with native species.

Alternative 2 - *Continuation of Existing Management (No Action Alternative)*

BLM would continue livestock grazing management in accordance with the 1984 Southern Malheur Rangeland Program Summary (RPS) and associated planning documents.

New range development projects would generally be limited in scope and consist mainly of those actions already authorized in existing EA Decisions or actions beneficial for LCT habitat as shown in Table C.

The sequence and timing of summer livestock use in upper elevation pastures of 15 Mile Community Allotment (V, Greenponds, and Dry Creek) and Whitehorse Butte Allotment (Willow and Fifteen Mile) supporting LCT would not change. In these pastures BLM would continue to authorize two years of grazing use followed by two years of rest. Livestock numbers and utilization levels in pastures supporting LCT would not change.

Livestock would continue to be turned into 15 Mile Community (V, Greenponds, Whitehorse, and Dry Creek Pastures) and Whitehorse Butte Allotment (Willow and 15 Mile Pastures) upper elevation pastures supporting LCT from May 15th until July 15th. Under current management grazing use is not allowed to exceed a total of 60 days. Management flexibility would continue to allow for the possibility grazing use up to July 31st provided cold and wet spring weather and heavy snow-pack conditions.

Authorized grazing use on lower elevation LCT habitat of Willow Creek (Whitehorse Butte Allotment, Red Mountain South Pasture) would not change. Livestock use would continue to be allowed annually from March 16th to May 15th (60 days). The 60 day use period is a deviation from the original 45 days specified in the Whitehorse Butte Allotment Management Plan but it was authorized in an amendment to the FWS Biological Opinion (2004).

Grazing use in Zimmerman Allotment pastures that support LCT would not change.

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[2] Throughout this document, BLM reference to natural values includes all or some subset of the resource attributes described in this sentence.

BLM would allow construction of a ¼ to ½ mile east/west drift fence in Red Mountain North Pasture of Whitehorse Butte Allotment to deter livestock movement north. The fence would be built in a way that would continue to allow wild horse access to water sources in Red Mountain North Pasture.

BLM would corridor fence Willow Creek in Red Mountain North Pasture to protect and recover LCT habitat north of the Whitehorse Road. Construction would include a water gap so livestock and wild horses would continue to have access to drinking water.

Restoration or repair of springs would occur where resource conditions warrant action.

Indian Creek in McCormick Allotment would continue to be managed for riparian habitat values. However, LCT management concerns are no longer an issue for BLM in this location because the resident fish population is hybridized and they are therefore no longer a part of the existing LCT Recovery Plan.

Under Alternative 2, BLM would reduce the length of selected water gaps created by riparian exclosures already in place on Little Whitehorse Creek (Whitehorse Butte Allotment, 15 Mile Pasture) and remove selected riparian exclosures already in place on Willow Creek (Whitehorse Butte Allotment, Red Mountain South, and Willow Pastures). Restoration or repair of springs would also occur where resource conditions warrant action.

Tenmile Allotment would continue to provide livestock forage for permittees demonstrating the greatest need for livestock AUMs. Under current management, no single permittee has been assigned the AUMs available in Tenmile Allotment.

No new fencing for grazing administration purposes within WSAs would occur.

Approved fire fuels and weed treatment projects already analyzed in EA OR-030-99-009 *McDermitt Complex Restoration / Rehab, and Noxious Weed Control Project* and EA OR-030-00-008 *Southern Trout Creeks Habitat Maintenance, Prescribed Burn* would be allowed because BLM Decisions on these actions have already been issued. The projects authorized within the Evaluation area are highlighted in yellow in Table D.

Alternative 3 - *Proposed Action and Preferred Alternative*

BLM management actions would conform to criteria directed by the 2002 Southeastern Oregon Resource Management Plan Record of Decision (SEORMP ROD) instead of the 1984 Southern Malheur Rangeland Program Summary (RPS) and associated planning documents.

BLM would accept certain proposed permittee range development projects and proposed grazing systems shown in Tables C and D.

The sequence of summer livestock grazing use in upper elevation pastures supporting LCT in 15 Mile Community Allotment (V, Greenponds, and Dry Creek Pastures) and Whitehorse Butte Allotment (Willow and 15 Mile Pastures) Allotments would change. Instead of two consecutive years of grazing use and two consecutive years of rest under existing management, BLM would now allow one year of grazing use followed by one year of rest. The amount of livestock average actual use authorized under current management would not change.

The timing of summer livestock grazing use in the pastures described above would also change compared to existing management. Livestock would be turned into V or Greenponds pastures on June 1st and be allowed to stay until July 31st instead of turning in on May 15th and staying until July 15th under existing management. Livestock would be turned into Willow or Fifteenmile pastures on June 1st and be allowed to stay until July 31st instead of turning in on May 1st and staying until June 30th under existing management.

Alternative 3 would continue to allow a total of 60 days permitted grazing use in upper elevation pastures supporting LCT in 15 Mile Community (V, Greenponds, Whitehorse, and Dry Creek Pastures) and Whitehorse Butte (Willow and 15 Mile Pastures) Allotments, as authorized under existing management. Livestock numbers and utilization levels in pastures supporting LCT would not change. In order to protect aquatic, upland, and other natural values, BLM would not allow for a 15 day grazing use extension in August. During years of grazing use, all livestock would be removed from these pastures by July 31.

Total authorized grazing use on lower elevation LCT habitat of Willow Creek (Whitehorse Butte Allotment, Red Mountain South Pasture) would be reduced compared to current management. BLM would now allow annual grazing between April 1st and May 15th (45 days) instead of the annual use from March 16th to May 15th (60 days) currently authorized under a 2004 amendment to the FWS Biological Opinion.

Grazing use in Zimmerman Allotment pastures that support LCT would not change.

BLM would allow construction of a ¼ to ½ mile east/west drift fence in Red Mountain North Pasture of Whitehorse Butte Allotment to deter livestock movement north. The fence would be built in a way that would continue to allow wild horse access to water sources in Red Mountain North Pasture.

BLM would corridor fence Willow Creek in Red Mountain North Pasture to protect and recover LCT habitat north of the Whitehorse Road. Construction would include a water gap so livestock and wild horses would continue to have access to drinking water.

Restoration or repair of springs would occur where resource conditions warrant action.

Indian Creek in McCormick Allotment would continue to be managed for riparian habitat values. However, LCT management concerns are no longer an issue for BLM in this location because the resident fish population is hybridized and they are therefore no longer a part of the existing LCT Recovery Plan.

Under Alternative 3, BLM would reduce the length of selected water gaps created by riparian exclosures already in place on Little Whitehorse Creek (Whitehorse Butte Allotment, 15 Mile Pasture) and remove selected riparian exclosures already in place on Willow Creek (Whitehorse Butte Allotment, Red Mountain South, and Willow Pastures). Restoration or repair of springs would also occur where resource conditions warrant action.

Tenmile Allotment would no longer serve as a forage base for permittees demonstrating the greatest need for livestock AUMs as under current management. Instead, available livestock forage would be permanently allocated to GJ Livestock (Fred Wilkinson) because McCormick Allotment would likely sustain the highest reduction in grazing preference following permit renewal.

BLM would sub-divide Angel Canyon Native pasture with two new east/.west fence segments. About one mile total of new fence would be required. Following construction, the north side would be used by David

Etchart livestock and south side would be used in common by Lucky 7 Ranch and Cleto Maguira livestock. The proposed fence would be located in the Oregon Canyon WSA.

BLM would also allow construction of a ¼ mile gap fence in Disaster Peak Native Pasture of Zimmerman Allotment to deter drift of livestock from grazing allotments in Nevada. The proposed fence is located in the Disaster Peak WSA.

Approved fire fuels and weed treatment projects already analyzed in EA OR-030-99-009 *McDermitt Complex Restoration / Rehab, and Noxious Weed Control Project* and EA OR-030-00-008 *Southern Trout Creeks Habitat Maintenance, Prescribed Burn* would be allowed because BLM Decisions on these actions have already been issued. The projects authorized within the Evaluation area are highlighted in yellow in Table D.

Under Alternative 3 BLM would allow for repeated brush mowing maintenance, once or twice every five to ten years, in selected pastures and areas within pastures including the following: 15 Mile Community Allotment - *Basque Seeding West, Etchart Seeding, McDermitt Seeding West* and McCormick Allotment - *Flat Top Seeding*. Repeated brush mowing over time would be allowed in order to emphasize long term grass production in some parts of pastures while maintaining shrub canopy cover sufficient to support wildlife needs in others. Existing management does not allow for such re-treatment without additional environmental analyses.

BLM would allow chemical control of rabbitbrush with 2-4d or other approved compounds if and when the current Oregon pesticide injunction is resolved. Allowable chemical treatment areas would be confined to brush beaten areas only in Etchart Seeding and Flattop Seeding.

BLM would not allow Temporary Non-Renewable (TNR) grazing use on native rangeland in order to protect natural values including intact native plant communities, special status plants and animals, wildlife habitat, riparian areas, visual resources, recreational opportunities, and various wilderness characteristics.

Some low elevation cheatgrass dominated areas near McDermitt would be open to late season TNR forage allocation on a case by case basis provided the following conditions exist: (1) climatic conditions have resulted in exceptionally high volume cheatgrass production (2) residual grass cover following authorized use is adequate to protect soils from accelerated erosion. Also see page 59-60 of the SEORMP ROD for other resource management criteria that would need to be met before TNR would be authorized.

High intensity grazing or mechanical treatment of rank, standing crested wheatgrass (wolf plants) would be authorized periodically if necessary to restore plant vigor and productivity. This treatment would be authorized if it can be clearly demonstrated with utilization and trend plot studies that crested wheatgrass plant health would not be compromised.

BLM would seed crested wheatgrass and/or other adapted perennial plants along low elevation roads or other highly disturbed locations (such as old water haul sites or salting areas) to reduce the incidence and spread of invasive plants. Where necessary to accomplish the same task above 5,000 feet elevation, BLM would seed exclusively with native species.

Alternative 4

BLM management actions would conform to criteria directed by the 2002 Southeastern Oregon Resource Management Plan Record of Decision (SEORMP ROD) instead of the 1984 Southern Malheur Rangeland Program Summary (RPS) and associated planning documents.

BLM would accept certain proposed permittee range development projects and implement grazing systems shown in Tables C and E.

BLM would not allow new fences or livestock water developments over 5,000 feet elevation to protect natural values from potential adverse impacts resulting from expanded livestock grazing use and range development structures.

New livestock water developments below 5,000 feet elevation would be permitted in crested wheatgrass seedings but not in native range pastures in order to avoid further disturbance which would likely increase the incidence and spread of cheatgrass.

Land treatment actions would focus exclusively on eliminating or greatly diminishing cheatgrass influences so as to interrupt shortened fire return intervals. Pastures already seeded such as Bretz Seeding (McCormick Allotment) or Willow Butte Seeding (Whitehorse Butte Allotment) that support little or no cheatgrass would be excluded from rangeland treatment actions such as burning, re-seeding, or brush mowing.

The sequence of summer livestock grazing use in upper elevation pastures supporting LCT in 15 Mile Community Allotment (V, Greenponds, and Dry Creek) and Whitehorse Butte Allotment (Willow and 15 Mile Pastures) Allotments would change. Instead of two consecutive years of grazing use and two consecutive years of rest under existing management, BLM would now allow one year of grazing use followed by one year of rest. In addition, livestock average actual use in these pastures would be diminished by 20% to reduce grazing impacts on natural values.

The timing of summer livestock grazing use in the pastures described above would also change compared to existing management. Livestock would be turned into V or Greenponds pastures on June 1st and be allowed to stay until July 31st instead of turning in on May 15th and staying until July 15th under existing management. Livestock would be turned into Willow or Fifteenmile pastures on June 1st and be allowed to stay until July 31st instead of turning in on May 1st and staying until June 30th under existing management.

Alternative 4 would continue to allow a total of 60 days permitted grazing use in upper elevation pastures supporting LCT in 15 Mile Community (V, Greenponds, and Dry Creek Pastures) and Whitehorse Butte (Willow and 15 Mile Pastures) Allotments, as authorized under existing management.. In order to protect natural values, BLM would not allow for a 15 day grazing use extension in August. During years of grazing use, all livestock would be removed from these pastures by July 31.

Total authorized grazing use on lower elevation LCT habitat of Willow Creek (Whitehorse Butte Allotment, Red Mountain South Pasture) would be reduced compared to current management. BLM would now allow annual grazing between April 1st and May 15th (45 days) instead of the annual use from March 16th to May 15th (60 days) currently authorized under a 2004 amendment to the FWS Biological Opinion.

Grazing use in Zimmerman Allotment pastures that support LCT would not change.

BLM would avoid construction of a partial east/west drift fence in Red Mountain North Pasture of Whitehorse Butte Allotment to deter livestock movement.

Instead of constructing a corridor fence and water gap on Willow Creek in Red Mountain North Pasture to protect and recover LCT habitat, BLM would change the grazing season of use and avoid the need for new fencing. Grazing in Red Mountain North Pasture would only be allowed until the end of May to protect LCT habitat.

Restoration or repair of springs would occur where resource conditions warrant action.

Indian Creek in McCormick Allotment would continue to be managed for riparian habitat values. However, LCT management concerns are no longer an issue for BLM in this location because the resident fish population is hybridized and they are therefore no longer a part of the existing LCT Recovery Plan. BLM would reduce the length of selected water gaps created by riparian exclosures already in place on Little Whitehorse Creek (Whitehorse Butte Allotment, 15 Mile Pasture) and remove selected riparian exclosures already in place on Willow Creek (Whitehorse Butte Allotment, Red Mountain South, and Willow Pastures). Restoration or repair of springs would also occur where resource conditions warrant action.

Tenmile Allotment would no longer serve as a forage base for permittees demonstrating the greatest need for livestock AUMs as under current management. Instead, available livestock forage would be permanently allocated to GJ Livestock (Fred Wilkinson) because McCormick Allotment would likely sustain the highest reduction in grazing preference following permit renewal.

BLM would avoid new fencing in Angel Canyon Native pasture for David Etchart, Lucky 7 Ranch, and Cleto Maguira livestock and thus avoid the necessity for new fence construction within a WSA.

BLM would not allow construction of a ¼ mile gap fence in Disaster Peak Native Pasture of Zimmerman Allotment to deter drift of livestock from grazing allotments in Nevada and thus avoid the necessity for new fence construction within a WSA.

Approved fire fuels and weed treatment projects already analyzed in EA OR-030-99-009 *McDermitt Complex Restoration / Rehab, and Noxious Weed Control Project* and EA OR-030-00-008 *Southern Trout Creeks Habitat Maintenance, Prescribed Burn* would be allowed because BLM Decisions on these actions have already been issued. The projects authorized within the Evaluation area are highlighted in yellow in Table D.

Under Alternative 4 BLM would allow for repeated brush mowing maintenance, once or twice every five to ten years, in selected pastures and areas within pastures including the following: 15 Mile Community Allotment - *Basque Seeding West, Etchart Seeding, McDermitt Seeding West* and McCormick Allotment - *Flat Top Seeding*. Repeated brush mowing over time would be allowed in order to emphasize long term grass production in some parts of pastures while maintaining shrub canopy cover sufficient to support wildlife needs in others. Existing management does not allow for such re-treatment without additional environmental analyses.

No chemical control of rabbitbrush within brush beaten areas would be allowed in Etchart Seeding, Schoolhouse Seeding East and West, and Flattop Seeding.

BLM would not allow any Temporary Non-Renewable (TNR) grazing use anywhere on public land in order to protect natural values including intact native plant communities, special status plants and

animals, wildlife habitat, riparian areas, visual resources, recreational opportunities, and various wilderness characteristics.

High intensity grazing or mechanical treatment of rank, standing crested wheatgrass (wolf plants) would not be authorized regardless of forage plant vigor and productivity.

BLM would seed crested wheatgrass and/or other adapted perennial plants along low elevation roads or other highly disturbed locations (such as old water haul sites or salting areas) to reduce the incidence and spread of invasive plants. Where necessary to accomplish the same task above 5,000 feet elevation, BLM would seed exclusively with native species.

In response to Assessment findings, BLM would require 3 to 5 years of growing season rest in all pastures where decline in upland plant vigor is associated with grazing use and the downward trend is supported with trend studies. This action would impact the Whitehorse Butte Allotment (Buckskin Seeding, Frenchie South, and Whitehorse Seeding) and 15 Mile Community Allotment (Basque Seedings East and West, Etchart Seeding, McDermitt East Seeding, Oregon Canyon Seeding West, Pronghorn, Schoolhouse Seeding East and West and Overshoe Seeding North).

Following the temporary rest periods identified above, all pastures with a substantial amount of rangeland below 5,000 feet would be managed in a way that acknowledges their limited site potential and need for relatively conservative grazing use if grazing is allowed during the active growing season. Under this alternative, if grazing use is authorized during the active growing period (March 15 through May 15) BLM would incorporate alternating years of grazing use and then a full year of rest and maximum average utilization would not be allowed to exceed 40%. If grazing use is authorized during the winter period, maximum average utilization would not be allowed to exceed 60%. BLM would require these changes to limit summer/fall livestock trampling disturbance to biological soil crusts on native range and maintain/improve crested wheatgrass plant vigor.

Pastures affected by Alternative 4 season and utilization limit changes would include the following:

Whitehorse Butte Allotment - Red Mountain North and South, Buckskin Seeding, and Frenchie South

15 Mile Community Allotment - Blue Mountain, Oregon Canyon Seeding East, Etchart Seeding, Schoolhouse East and West Seedings, Angel Canyon Seeding, Buckbrush, Buckbrush Seeding, McDermitt Seedings East and West, Pronghorn, Burro Seeding, Overshoe Seedings North and South, and Frenchie North)

Tenmile Allotment - Tenmile Seeding

Albisu-Alcorta - Upper and Lower Lazy T

McCormick - Flattop Seeding

Barren Valley - The Gap, Threeman Butte Well, and 12 Mile Ridge

Other Alternatives Considered but Not Analyzed in Detail

Permit Annual Summer Grazing Use in Upper Elevation Pastures that Support LCT within 15 Mile Community and Whitehorse Butte Allotments

Summer grazing use in pastures that support LCT in 15 Mile and Whitehorse Butte Allotments would change compared to current management. BLM would permit summer grazing use every year and eliminate the requirement for periodic rest from grazing use. Livestock stocking rates and seasons of use (June 1st to July 31st) in pastures that either directly or indirectly affect LCT would be the same as described in the preferred alternative.

BLM considered this alternative for 15 Mile and Whitehorse Butte Allotments because on several occasions, permittees have expressed the desire to return to their historic annual grazing use in high elevation pastures of TCGMA. No such request has been mentioned by the Zimmerman Allotment permittee. Although this alternative is acknowledged as a potential management option, it was not analyzed in detail for two principle reasons.

First, BLM believes the environmental impacts of annual summer grazing use on riparian areas would result in poor quality riparian conditions nearly identical to those that required rangeland management changes in the late 1980's. Given the size of livestock herds in the allotments considered, attainment of properly functioning riparian conditions would be highly unlikely. Second, BLM believes that under this option the FWS would likely be forced to issue a Biological Opinion on BLM action indicating jeopardy to the continued existence of LCT in the affected pastures. Thus, compliance with federal Endangered Species Act requirements for LCT conservation and recovery would be highly unlikely if annual summer grazing use was authorized.

Chapter 4 - TCGMA Evaluation Recommendations

Based on examination and evaluation of the TCGMA Rangeland Health assessment data, the following recommendations for resource management have been proposed by the Jordan Resource Area Interdisciplinary Team.

RANGELAND VEGETATION (RV)
The following recommendations address Rangeland Health Standard 1 (W*atershed function, uplands)* and Standard 3 *(*E*cological processes)*:

RV REC1: Manage grazing use in native rangelands so that utilization levels are consistent with other resource values.

SPECIAL STATUS PLANT SPECIES (SS)
The following recommendation addresses Rangeland Health Standard 3 *(*E*cological processes)*:

SS PLANTS REC1: Manage the land within the TCGMA to maintain, restore, or enhance populations and habitats of special status plant species with particular emphasis on the two species considered most vulnerable: Davis peppergrass and profuse-flowered mesa mint.

RIPARIAN AND AQUATIC HABITATS (RIP)
The following recommendations address Rangeland Health Standard 2 (W*atershed function, riparian)*, Standard 4 *(*W*ater Quality),* and Standard 5 (*Native, T&E, or locally important species*—Riparian):

RIP REC 1: Alleviate hot and late-season grazing in riparian areas, where, because of livestock grazing impacts, riparian/wetland areas do not meet Rangeland Health Standards 2, 4, and 5. Incorporate early-season or winter use and rest to allow regrowth of riparian vegetation and avoid utilization of woody riparian species, such as willows.

RIP REC 2: Fence or otherwise exclude livestock from streams and riparian/wetland areas if early-season grazing is not feasible. In addition, fence to exclude livestock from those riparian areas (springs, wetlands, or streams) that are assessed as Functioning-at-Risk with a downward trend. Ensure that corridor fence placement is sufficiently outside of Riparian Conservation Areas to allow for lateral expansion of hydric soils and riparian vegetation.

RIP REC 3: In pastures, where, because of livestock grazing impacts, riparian/wetland areas do not meet the *physical* component of Rangeland Health Standards 2 and 5, implement grazing systems which will alleviate hot season impacts and increase desirable herbaceous and woody riparian vegetation to attain proper functioning condition appropriate to soil, climate, and landform and also to promote the achievement of state water quality standards.

RIP REC 4: In pastures, where, because of livestock grazing impacts, riparian/wetland areas do not meet the *biological* component of Rangeland Health Standards 2 and 5, implement grazing systems to achieve an upward trend appropriate to soil, climate, and landform.

RIP REC 5: Avoid new spring developments and remove developments from water sources that are not essential for livestock management. Similarly, avoid new pipeline construction that sequesters natural water sources thereby desiccating other wetland areas.

RIP REC 6: Where spring developments exist, implement proper trough placement away from wet areas so that livestock are not concentrated on fragile wet soils and vegetation. Ensure that troughs are equipped with valves or water return systems to prevent leakage and diversion of water away from the stream channel or riparian/wetland area.

RIP REC 7: Relocate Exchange Spring and Coffeepot Spring pipelines out of riparian meadows and restore associated meadows to remedy stream channel flow interception, erosion, and exposed hydric soils caused by the original pipeline placement.

RIP REC 9: Relocate or repair road crossings in New Road Spring and Three Week Spring drainages that impair riparian/wetland areas and water quality. Repair road at New Road Spring where it crosses, intercepts, and channels streamflow along the road. Relocate and repair the road crossing at Three Week Spring to stabilize a head cut and prevent an upstream migration that could endanger wetland habitat.

RIP REC 10: Deviations in authorized annual grazing use within pastures supporting riparian communities will be considered on a case by case basis after a review of existing resource conditions and monitoring data is conducted by the Jordan Resource Area Interdisciplinary Team.

WILDLIFE AND WILDLIFE HABITAT / SPECIAL STATUS ANIMAL SPECIES (WLDF)
The following recommendations address Rangeland Health Standard 5 terrestrial species (N*ative, T&E, or locally important species*):

WLDF REC1: Manage TCGMA fire and land treatment disturbance in a way that will maintain a large geographic extent of complex big sagebrush shrublands capable of supporting terrestrial wildlife species of management importance. By doing so, BLM will conserve valuable sagebrush steppe shrubland habitats that possess Interior Columbia Basin Ecosystem Management Project *Terrestrial Source Habitat* qualities and practice land management stewardship that conforms to the terrestrial wildlife-community-based objective identified in the SEORMP. Sagebrush shrub cover provides important forage and habitat structure for wildlife

WLDF REC2: Design land treatment disturbances within the Evaluation area so that the geographic extent of grassland habitat in contiguous blocks (160 acres or larger) is limited and sagebrush habitat connectivity can be maintained among grazing allotments and pastures.

WLDF REC3: Manage livestock grazing use so that it will maintain or improve the current distribution and health of deep rooted native perennial grasses and native forbs. Native forbs and grasses provide important sources of forage and habitat structure for wildlife.

WLDF REC4: Practice mechanical methods of land treatment, wherever shrubland habitats are present, instead of using prescribed fire. Prescribed fire is prone to escape beyond planned ignition areas and the adverse consequences of fire on wildlife habitat structure are far more significant, long lasting, and damaging than what can be expected from mechanical treatment.

WLDF REC6: Limit chemical treatment of rangelands to locations where gray rabbitbrush dominance is a management issue or where invasive annual plant control can be accomplished.

WLDF REC7: Avoid new water developments for the purpose of extending livestock grazing access into high quality condition native rangelands, especially in sage-grouse nesting and early brood-rearing habitats.

WLDF REC8: Avoid temporary non-renewable native range grazing use authorization in pastures that support sage grouse nesting and early brood-rearing activities.

WLDF REC9: Where necessary, adjust livestock grazing practices so that stream, wetland, and meadow quality and quantity is improved over time.

RANGELAND/GRAZING USE MANAGEMENT (RANGE)

The following recommendations address Rangeland Health Standard 1 (W*atershed function, uplands)* and Standard 3 *(*E*cological processes)*:

RANGE REC1: Manage grazing to provide for sustainable rangelands and livestock operations.

RANGE REC2: Re-establish utilization transects in all pastures. Utilization readings are to be taken at established locations.

RANGE REC3: Allow for 15 days flexibility in pasture move dates, as long as use is within permitted AUMs, consistent with resource objectives, and is applied for in writing.

RANGE REC4: Provide livestock watering facilities, and fences where needed, consistent with other resource values.

RANGE REC5: Proposed permittee deviations from planned grazing use authorizations must be provided in writing to the authorized officer at least two weeks prior to the proposed change date.

CULTURAL RESOURCES (CR)

CR REC1: Design water source exclusion fences and other livestock exclusion fences to encompass cultural resource sites to surface manifestation boundaries.

CR REC2: Avoid new spring developments that include surface or subsurface ground disturbance in areas where cultural resources are present

CR REC3: Avoid new spring developments and remove developments from water sources that are not essential for livestock management where cultural resource sites are located. Similarly, avoid new pipeline construction that sequesters natural water sources thereby desiccating other wetland areas where cultural resources are present.

CR REC4: Where spring developments exist, implement proper trough placement away from wet areas so that livestock are not concentrated on fragile wet soils and vegetation where cultural resources are present. Ensure that troughs are equipped with valves or water return systems to prevent leakage and diversion of water away from the stream channel or riparian/wetland area.

CR REC5: Manage TCGMA in a way that will maintain a large geographic extent of complex sagebrush shrublands. By doing so, BLM will conserve valuable cultural resources in situ. Native vegetation of sagebrush steppe ensures minimum erosional activity that may threaten cultural resources.

CR REC6: Manage to maintain or improve the distribution and health of deep rooted native perennial grasses and native forbs. By doing so, BLM will conserve valuable cultural resources in situ. Native vegetation of sagebrush steppe ensures minimum erosional activity that may threaten cultural resources.

Chapter 5 – TCGMA Activity Plan Level Objectives

Activity plan level objectives appropriate to TCGMA and identified in this section are consistent with Resource Management Plan Objectives in the SEORMP/Record of Decision (pages 28 to 111) for Rangeland Vegetation, Special Status Plant Species, Water Resources and Riparian/Wetlands, Fish and Aquatic Habitat, Wildlife and Wildlife Habitat, Special Status Animal Species, Rangeland/Grazing Use Management, Cultural Resources, and Human Uses and Values.

RANGELAND VEGETATION (RV)

RANGE VEG OBJ1: Maintain ecological function and health of vegetation communities. This would be evidenced by overall trend (photo-plot, line intercept, and professional judgment determinations) in either a not apparent or upward designation.

RANGE VEG OBJ2: Manage livestock grazing use in native range so that utilization levels are predominantly light (21 – 40%) and consistent with other resource values.

RANGE VEG OBJ3: Manage livestock grazing use in non-native seedings so that utilization levels do not exceed 60%.

RANGE VEG OBJ4: Manage big sagebrush cover in seedings and on native rangeland to meet the life history requirements of sagebrush-dependent wildlife.

SPECIAL STATUS PLANT SPECIES (SS)

SS PLANT OBJ1: Maintain or increase population numbers of two List 1 special status plant species found at Bull Flat Playa (profuse-flowered mesa mint) and Pigeontoe Playa (Davis' peppergrass).

SS PLANT OBJ2: Maintain population numbers of all other special status plant species.

SS PLANT OBJ3: Continue inventory and assessments for List 3 species so that their status can be more adequately addressed within the area.

RIPARIAN AND AQUATIC HABITATS (RIP)

See Table 8, Riparian Trend Analysis, for methods that would be used to measure riparian objectives.

RIP OBJ 1: Maintain ecological function and health of vegetation communities. Increase streambank stability through increase of riparian species that provide a root matrix for holding soil particles together. Make progress toward >80 percent stable banks (same as INFISH Riparian Management Objective 1), and attain an upward trend in the following indicators:

- stream meanders are increasing
- incised channels are healing with vegetation cover

RIP OBJ 2: Decrease stream channel width/depth ratio (same as INFISH Riparian Management Objective 2), such that water depth is increasing and stream channel width is narrowing

RIP OBJ 3: Increase streambank shade through the improvement of riparian/wetland areas that support desired shade-providing riparian herbaceous and woody species. Using increases in height and volume of streambank-shading canopy as a surrogate indicator of lower stream temperatures, stream temperatures in perennial reaches will have no measurable increase (same as INFISH Riparian Management Objective 3).

RIP OBJ 4: Increase abundance and diversity of desirable woody and herbaceous riparian vegetation by attaining upward trends in the following indicators (same as INFISH Riparian Management Objective 4):

- at sites with ecological potential for woody vegetation, increase the overall number, species diversity, and canopy volume (height and width) of key woody plants
- at sites with ecological potential for woody vegetation, acquire healthy uneven-aged stands of key woody plants
- increase the overall surface area of herbaceous ground cover
- shift herbaceous species composition toward more late-succession species, such as Nebraska sedge, replacing more xeric-adapted species such as Douglas sedge and Baltic rush

WILDLIFE/WILDLIFE HABITAT AND SPECIAL STATUS ANIMAL SPECIES (WLDF)

Evaluation area habitats and associated terrestrial wildlife to be considered in long-term management are listed below**.** Wildlife in bold italics have some form of special management significance due to one or more of the following; Migratory Bird Treaty Act requirements, Oregon/Washington Special Status Species Policy, species associated with shrub steppe habitats that have declined substantially in the Interior Columbia Basin area since historical times, or Oregon Department of Fish and Wildlife trophy species. See table F for an account of special status designations by species.

(Type 1) Playas and Salt Desert Wetlands

waterfowl, marsh wren, northern harrier (breeding), ***greater sage-grouse***, pronghorn

(Type 2) Black Greasewood / Buffaloberry Bottomlands

mule deer, black-tailed jackrabbit, mountain cottontail, coyote; black-throated sparrow, California quail, golden eagle (yearlong)

(Type 3) Mixed Salt Desert / Basin Big Sagebrush/ Wyoming Big Sagebrush

kit fox, pronghorn, ***pygmy rabbit***, white-tailed antelope squirrel, black-tailed jackrabbit; golden eagle, ***greater sage-grouse*** (winter), burrowing owl, long-billed curlew, loggerhead shrike, long-nosed leopard lizard, desert horned lizard

(Type 4) Wyoming Big Sagebrush

mule deer, pygmy rabbit, greater sage-grouse (nesting and early brood rearing), Brewer's sparrow, sage thrasher, short-horned lizard

(Type 5) Low Sagebrush

pronghorn and ***greater sage-grouse (pre-nesting and early brood-rearing)***

(Type 6) Mountain Big Sagebrush

mule deer, sagebrush vole, ***greater sage-grouse*** (nesting and early to late brood rearing), green-tailed towhee, sage thrasher, short-horned lizard

Type 7) Mixed Mountain Shrubs (principle mountain shrub species include mountain mahogany, bitterbrush, snowbrush, serviceberry, bittercherry, currant, and snowberry)

mule deer, least chipmunk, ***greater sage-grouse***, mountain bluebird, black-throated gray warbler, Virginia's warbler (unverified), gray flycatcher

Type 8) Large Canyons and Steep Rock faces

California bighorn sheep, yellow-bellied marmot, prairie falcon, golden eagle, chukar partridge, rock wren

Type) 9 Willow / Aspen / Alder / Wet Meadow Riparian Areas

mule deer (fawning), Swainson's hawk, ***greater sage-grouse*** (late brood rearing), **greater sandhill crane, Lewis' woodpecker,** Bullock's oriole

Type 10) Seeded rangelands

greater sage-grouse, pronghorn, ***mule deer***, black-tailed jackrabbit, Brewer's sparrow

WLDF OBJ1

Maintain a high level of sagebrush community shrub cover connectivity among the pastures and grazing allotments of TCGMA over the next 20 years as described below.

- Adaptive management involving BLM land treatments and wildfire suppression will incorporate shrub dependent wildlife habitat needs at multiple spatial scales to limit sagebrush community fragmentation and conform to the grassland/shrubland disturbance thresholds identified in the SEORMP (ROD page (*x*) and pages F-5 through F-11).

- Maintain 85% or more of TCGMA Wyoming, mountain, and basin big sagebrush communities as shrub cover Class 3, 4, and 5 habitats as described in the ROD. This objective applies to both native and seeded rangelands. The structural class objective is met in all three sagebrush habitat types where sagebrush canopy cover ranges from at least 10% to 50% (estimated or measured by line intercept) and shrub plants are in a predominantly middle to late structural condition. BLM estimates that about 429,300 to 464,100 acres of TCGMA are comprised of big sagebrush range-sites and about 49,300 of these acres (10.6% to 11.5%) are currently in a grassland status[3] due to disturbance. This rangeland vegetation and wildlife habitat objective therefore allows for a total maximum of about 64,400 to 69,600 acres of grassland resulting from land treatments and wildfire. Because there are currently about 49,300 acres of TCGMA grassland present, no more than 15,100 to 20,300 acres of new grassland habitat should be allowed over the next 20 years if BLM is to stay within the bounds of the ROD and meet the Desired Range of Future Conditions for wildlife and rangeland vegetation.
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[3] This analysis specifically excludes big sagebrush habitat acres within the Barren Valley or Rattlesnake GMAs. When Rattlesnake and Barren Valley GMAs are assessed and evaluated in the future, a similar wildlife habitat calculation will be made for management and analysis purposes.

- Due to the accuracy limitations of existing range survey data, BLM does not know exactly how many acres of big sagebrush habitat is included in TCGMA. However, for management purposes and for building cumulative impact analyses, the amount of additional grassland habitat allowable within TCGMA for the next 20 years should be no more than 17,700 acres. This acreage figure represents the mid-point between 15,100 and 20,300 acres estimated in the previous bullet paragraph above.
-
- Limit mountain big sagebrush habitat prescribed fire treatments in TCGMA to those that have been approved in the Southern Trout Creeks Habitat Maintenance EA. Burned areas should not exceed about 3,000 to 4,000 acres total when the project is completed.
-
- Where necessary, allow land treatments in native rangeland as long as the combined amount of disturbance resulting in grassland conditions does not exceed 30% to 40% of any TCGMA pasture unit.
-
- Minimize the geographic extent of grassland habitats in large land blocks (160 acres or more).
-
- Maintain at least 40% to 50% shrubland cover conditions favorable for sagebrush dependent terrestrial wildlife in non-native seedings.
-
- Appropriate fire management response planning for TCGMA will promote and complement the attainment of TCGMA sagebrush habitat management objectives. To the extent that it is possible, minimize wildfire impact areas over the next 20 years. Appropriate management responses to wildfire should be planned on an annual basis.
-
- Provide herbaceous plant composition consistent with mid, late, and Potential Natural Community ecological status in all upland habitats. Desirable herbaceous plant communities for wildlife are comprised of native perennial grasses and multiple species of native forbs (annual and perennial species) consistent with site potential described in Natural Resource Conservation Service (NRCS) site guides.

- Regulate grazing use on native rangeland so that wildlife habitat structure and forage impacted by grazing use is adequate to meet wildlife life history needs. Grasses, forbs, and shrubs all provide forage and structure important to wildlife and each of these plant classes are impacted by grazing use disturbance. This Evaluation area objective will be attained by managing grazing use in native range so pasture utilization levels are predominantly slight (6-20%) or light (21-40%) at reasonable distances from livestock water sources and salting areas. The objective will be met when at least 75% of pasture utilization stops fall within slight or light utilization classes. *Livestock utilization is not in its self considered a resource management objective. However, livestock utilization patterns provide strong, indirect evidence of how likely a grazing system and stocking rate will be able to sustain native plant communities and meet wildlife forage and structure needs*.

WLDF OBJ 2
Provide quality riparian habitat for terrestrial wildlife, consistent with site potential and capability.

- Manage grazing use over the long term so that woody riparian plant species show signs of successful reproduction as evidenced by the presence of multiple-age class willow and aspen.

- Manage grazing use so that quality herbaceous plant cover is available for terrestrial wildlife communities.
- Where wildlife habitat improvement is needed and undesirable conditions are caused by livestock grazing use, riparian wildlife habitat objectives will be met when substantial upward trend is indicated in monitoring studies. Evidence of management success in meeting wildlife habitat objectives is based on the presence of multiple upward trend indicators.

Wildlife habitat management objectives for LCGMA will be addressed sufficiently in TCGMA by managing for a substantial upward trend in habitat conditions. Refer to Specific Desired Plant Community Objectives in SEORMP, Appendix F (pages 287-288).

WLDF OBJ 3
Management of Temporary Non-renewable (TNR) livestock grazing use authorizations.

- Allow for periodic fall TNR grazing use authorizations in crested wheatgrass or other exotic perennial grass seedings. *Livestock utilization on fall green-up* is allowed and will protect wildlife values as long as it does not exceed 40% by key forage plant method estimates.
- In TCGMA native rangelands, protect herbaceous forage, cover, and structure values important to terrestrial wildlife by denying requests for TNR grazing.

WLDF OBJ 4
- Facilitate the maintenance, restoration, and enhancement of bighorn sheep populations and habitats on public land. Pursue management in accordance with the most current State bighorn sheep management plan in a manner consistent with the principles of multiple use management.

RANGELAND/GRAZING USE MANAGEMENT (RANGE)

RANGE OBJ1: Provide for a sustained level of livestock grazing consistent with other resource objectives and public land use allocations.

HUMAN USES AND VALUES (HU)

HU OBJ1: Work cooperatively with private, community, and local government groups to diversify local economies and expand new industries consistent with other resource objectives. Continue to provide for customary commodity uses when consistent with other resource objectives.

Public Involvement Record February 2005 through Spring 2006

McDermitt, Nevada - Public Scoping Meeting Attendees (February 15, 2005)

BLM livestock Permittees
Bernardo Alcorta, Steve Maher, Fred Wilkinson, Evan and Tillie Zimmerman, Jeff White
Alan White, Cleto Maguira, Michelle Maguira, John Albisu, Richard Yturriondobeitia, and Brit Lay.

Other Interested Publics
None attended

TCGMA Interdisciplinary Team Members
Wayne Wetzel, Travis Fletcher, Cameron Rasor, Cynthia Tait, Jack Wenderoth, Jon Sadowski, Natalie Sudman, Jim Johnson, Lynne Silva, Joe O'neill, Brian Watts.

BLM presented information to permittees in a Microsoft Powerpoint format. The basis for why BLM conducts assessments, evaluations, and determinations about rangeland health was discussed. The relationship between 43CFR 4180 Rangeland Regulations, Oregon/Washington Standards and Guides, and the Southeastern Oregon Resource Management Plan was discussed. An explanation for why BLM conducts evaluations within the 8 Geographic Management Areas of Jordan Resource Area was provided. The timeline for submittal of scoping comments was reviewed and BLM made it clear that permittee proposals for potential remedies to problems are encouraged early in the assessment/evaluation phase. BLM emphasized that scoping comments needed to be in no later than March 31, 2005.

Vale, Oregon - Public Scoping Meeting Attendees (February 17, 2005)

BLM livestock Permittees
None attended.

Other Interested Publics
Jim Shake, Gene Bray, Bob Moore, Brian Wolf, Ray Perkins, Ken Bentz

TCGMA Interdisciplinary Team Members
Wayne Wetzel, Travis Fletcher, Cameron Rasor, Cynthia Tait, Jack Wenderoth, Jon Sadowski, Natalie Sudman, Susie Manezes, Joe O'neill, Brian Watts.

BLM covered the same information that was presented at the McDermitt meeting. A planning and implementation sequence document was added to this meeting so the public would have a clear understanding of the timelines and steps taken toward completing the TCGMA assessment and evaluation.

McDermitt, NV (September 19-20-21) and Vale, OR (September 22) 2005
Public Meetings to Summarize Preliminary Standards and Guides Determinations

BLM mailed meeting announcements out on August 16, 2005.

These meetings were attended by BLM staff including Cynthia Tait, Jack Wenderoth, Jon Sadowski, and Travis Fletcher. BLM presented an overview of preliminary Standards and Guides (S&G's) assessment

findings for TCGMA. At the time of the meeting BLM was still in a data and form compilation mode so final Determinations had not been made. Cameron Rasor, Jack Wenderoth, and Jon Sadowski completed the upland assessment work but now Cameron has transferred to USFS in Montana and Travis Fletcher is now the Rangeland Management Specialist for TCGMA.

Permittees present on September 19-21 included: Chris Bengoa, Cleto Maguira, Evan and Tillie Zimmerman, Richard Yturriondobeitia, Nick Wilkinson, Fred Wilkinson, John Albisu, Bernardo Alcorta, Greg Snow, Dale Roberts (with consultant Connie Bateman), Steve Maher, Brit Lay, Tim Draper.

Members of the public present on September 22 included: Bob Kindschy (Southeastern Oregon Resource Advisory Committee), Bob Moore (Western Watersheds Project) and Jim Shake (Western Watersheds Project and Oregon Natural Desert Association), Brian Wolfer and Walt VanDyke both representing Oregon Department of Fish and Game.

A series of GIS generated maps were used to illustrate grazing allotment boundaries, elevational gradients that influence range health and resilience, as well as other general background information.

BLM took notes at each of these meetings which were scanned into a Adobe pdf file entitled "Preliminary Assessment Finding Meetings".

McDermitt, NV (September 26-27) 2005
Annual Trout Creek Working Group (TCWG) Meeting
BLM presented general assessment findings and preliminary Determinations from the 2005 field season. TCWG members present included Doc & Connie Hatfield, Mary Hanson, Wayne Bowers, Richard & Janet. Yturriondobeitia, Steve Maher, Evan & Tillie Zimmerman, Tim Draper, Greg Snow, Chris Bengoa, Fred & Judy Wilkinson, Nick & Jamie Wilkinson, Larry Frazier (Associate District Manager Vale), Wayne Wetzel, Cynthia Tait, Jon Sadowski, Travis Fletcher, Bob Hooten (ODFW), Tim Walters (ODFW fish biologist ODFW) Allen Mauer and Nancy Gilbert (FWS, Bend Office), Reinard Okeson (Izaak Walton League), Earl McKinney (retired BLM).

Discussions covered a wide range of topics but tended to center on potential BLM options for grazing adjustments for the Trout Creek GMA and how TCWG might bring ONDA and/or WWP to the table and discuss options for management. The multi-scale sagebrush management approach identified in the SEORMP was presented and reviewed by the group

BLM made a commitment to consult with members of TCWG next April or so in arriving at alternatives for management for the upcoming environmental document. BLM expressed desire to formulate a preferred alternative for management with "buy-in" by TCWG prior to issuance of the environmental document.

McDermitt, NV (February 1, 2006) Annual User Meeting
BLM presented standard operating procedure items related to the upcoming grazing season.

A general update on the TCGMA Evaluation progress was presented. Notice was given that a meeting with the Trout Creek Working Group would probably occur in late March or April for the purpose of discussing proposed projects, grazing adjustments, and EA alternatives.

Some clarification about proposed permittee projects was obtained from Steve Maher, Evan Zimmerman, and Fred Wilkinson.

McDermitt, NV (March 7, 2006)
BLM met with Nick Wilkinson and John Albisu to discuss preliminary Determinations and allotment conditions. Nick said if the proposed grazing system they would like to use is acceptable, the new division fence they proposed would not be needed. Nick and John have been following the system they propose for the last 5 years. They would also like to have the EA consider authorization of Temporary Non-renewable AUM's in cheatgrass dominated areas when annual production is high. BLM also met with Dale Roberts (Treetop Ranches) and his consultant Conrad Bateman.

McDermitt, NV (March 8, 2006) BLM presentation of preliminary TCMWG range health determinations

Trout Creek Working Group
Chad Bacon, Earl McKinney, Doc Hatfield, Mary Hanson, Tim Walters ODFW, Bob Hooton ODFW, Walt VanDyke ODFW, Nancy Gilbert USFWS, Alan Mauer USFWS, Doug Young USFWS, Dale Robertson, Fred Wilkinson, , Nick Wilkinson, Clay Clifton, Steve Maher, Chris Bengoa, Tim Draper, Richard Yturriondobeittia, Arnie Zimmerman, Greg Snow

Others
Conrad Bateman, Consultant for Treetop Ranches

BLM employees
Cynthia Tait, Jon Sadowski, Andy Bumgarner, Travis Fletcher, Joe O'Neill, Mike Hartwell, Garth Ross, Doug Wiggins, Jack Wendroth, Cookie Landing

Vale, OR (March 10, 2006) BLM presentation of preliminary TCMWG range health determinations

BLM employees
Jon Sadowski, Travis Fletcher, Steve Christensen, Cynthia Tait, Jack Wenderoth, Garth Ross, Mike Hartwell, Cookie Landing

Other Agency employees
Ray Perkins ODFW

Interested Publics
Gene Bray WWP, Jim Shake ONDA WWP, Bob Moore WWP, Bob Kindschy RAC

Evaluation Area Permittees and Interested Publics

Ranching Community

*David Herman, Whitehorse Ranch
*Dale Roberts, Treetop Ranches
*David & Avelina Etchart, Etchart ranch
Steve & Amorita Maher
*Dick Harry, Lucky 7 Ranch

Mike Harry, Lucky 7 Ranch
*Evan & Tillie Zimmerman, Zimmerman Ranch
*Cleto Muguira
*Fred & Judy Wilkinson, GJ Ranch
*Richard & Jeanette Yturriondobeitia

Chris Bengoa, Lucky 7 Ranch
Greg Snow, Treetop Ranches
Nick Wilkinson, GJ Ranch
John Albisu,
*Bernardo Alcorta

* BLM permittees

Local Government, Citizens, Academia, and Various Organizations

Honorable Dan Joyce, Malheur County Judge
Monty Montgomery, Izaak Walton League
Stephen A. Moen, Izaak Walton League
Steve Wolper, Idaho Conservation League
Doug Heiken, Oregon Natural Resources Council

Gene Bray, Western Watersheds Project
Jon Marvel, Western Watersheds Project
Rose & Dennis Strickland, Sierra Club - Public Lands Committee, Reno, NV
Dr. Mary Peacock, University of Nevada, Reno
Linda S Craig, Audubon Society of Portland

Lew Curtis, Oregon Chapter, Sierra Club
Bill Marlett, Oregon Natural Desert Association
Peter M. Lacy, Staff Attorney, Oregon Natural Desert Association
Jim Shake, Oregon Natural Desert Association and Western Watersheds Project
Robert Moore, Oregon Natural Desert Association and Western Watersheds Project

Joseph Higgins, Wilderness Watch, Pacific Northwest Office
Joe Walicki, Oregon Environmental Council
Jim Myron, Oregon Trout
Hal Shepard, Northwest Environmental Defense Center
Chad Bacon, Izaak Walton League

Kathleen Simpson Myron
Reinard Okeson, Izaak Walton League
Jill Workman, Southeastern Oregon Resource Advisory Council
Mary Scurlock, Pacific River Council
Stuart Garrett, Native Plant Society of Oregon, High Desert Chapter

Gary & Marj Defenbaugh
Bob & Carol Kerby
Doc & Connie Hatfield, Hatfields High Desert Ranch
Wayne & Patty Bowers
Earl McKinney

Bill Barnett
Kenneth J Bentz, Harney County Commissioner
Cliff Bentz, Yturri, Rose, Burnham, Bentz & Helfrich
Bud Greeley
Duncan Mackenzie, Mackenzie Ranch

Robert and Sara Skinner
Jennifer Martin, Owyhee Watershed Council Coordinator
Robert Kindschy, Southeastern Oregon Resource Advisory Council

Native American Tribal Contacts

Tribal Chairperson, Ft. McDermitt Paiute-Shoshone Tribe
Gary Burke, Tribal Chair, Confederated Tribes of the Umatilla
Terry Shepard, Confederated Tribes of the Umatilla
Dean Adams, Tribal Chair, Burns Paiute Tribe

Government Agency Personnel

Mike Sevon, Nevada Department of Fish & Wildlife
Jim French, Nevada Department of Fish & Wildlife
Stephanie Byers, Nevada Department of Fish & Wildlife
Nancy Gilbert, Field Supervisor, U.S. Fish & Wildlife Service
Alan Mauer, U.S. Fish & Wildlife Service

Doug Young, U.S. Fish & Wildlife Service
Bob Hooten, Malheur Watershed District Manager, Oregon Department of Fish & Wildlife
Mary Hanson, Oregon Department of Fish & Wildlife
Walt VanDyke, Oregon Department of Fish & Wildlife
Ray Perkins, Oregon Department of Fish & Wildlife

Tim Walters, Oregon Department of Fish & Wildlife
Christian Hagen, Oregon Department of Fish & Wildlife