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Draft Assessment
Forest Plan Revision

Rangeland Resource Detailed Report

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February 6, 2024

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Rangeland Resource

Introduction

Rangelands in the Blue Mountains include a wide variety of ecosystems, including natural grasslands, shrublands, and riparian and wetland plant communities, including marshes and wet meadows. Rangelands suitable for grazing produce at least 200 pounds of forage per year per acre.

Livestock grazing, or the utilization of forage by domestic cattle, sheep, and horses, is a controversial use of natural resources on public lands. The Forest Service strives to sustain the health, diversity, productivity, and ecological integrity of the land to meet the needs of present and future generations by using the best available science and an ecological approach to multiple use management.

Process and Methods

The existing 1990 Malheur, Umatilla, and Wallowa-Whitman Forest Plans, as amended, the Current Management Situation of 2018, the withdrawn FEIS and draft Land Management Plans for the Malheur, Umatilla, and Wallowa-Whitman National Forests (USDA 2018) were the main sources of information for the draft assessment, utilizing the analysis and methodology presented in the documents and project record. Supplemental information needed to fulfill requirements in the 2012 Planning Rule is included in the Literature Cited section. All documents were reviewed for best available scientific information and relevancy to current conditions. Geographic Information System (GIS) technology was used where appropriate and available to assess rangeland capability and suitability.

The existing condition and trend of rangeland vegetation was assessed for various potential vegetation types in the Blue Mountains, derived from the Current Vegetation Survey (CVS) plot data. The CVS plots are a statistical sample of the landscape established from 1997 through 2004. A series of nested cover frequency and line transects samples were installed at each of the plots.

Upland rangeland vegetation trend information was developed using historical Parker 3-Step rangeland survey data from the mid-1950s through 2000. The Parker data is a set of permanent vegetation transects first established in the early 1950s to rapidly assess the condition of range vegetation and soils. Those transects were utilized that had been re-sampled through time as an indicator of trend, providing a picture of the change in vegetation through time.

State and Transition Models were used to evaluate the condition of rangelands. A few State and Transition models for bunchgrass plant communities were developed for the Blue Mountains in 2005, while others were derived from reference conditions of ecological site descriptions. These models are based on local vegetation data and expert opinion. Transitions between states are generally described by biotic thresholds based on vegetation composition.

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PACFISH and INFISH Biological Monitoring (PIBO) monitoring of riparian vegetation was collected from 2001 through 2022, Current trends for riparian and aquatic habitats for each aquatic species were assessed in this analysis, using data from regional-scale effectiveness monitoring using protocols developed in response to requirements of biological opinions for the 1990 Forest Plans as amended by PACFISH and/or INFISH (Archer et al. 2009, Archer and Ojala 2016a, 2016b, 2016c).

Scale

Rangelands are a unique component of the area, accounting for approximately 765,000 acres (16 percent) of National Forest System lands of the 4.9 million acres within the Malheur, Umatilla, and Wallowa-Whitman national forests (Blue Mountains national forests), excluding the Hells Canyon National Recreation Area. Including the additional grazable forest lands, the total grazing land is approximately 3,395,000 acres (69 percent) of the Blue Mountains national forests. National Forest System lands classified as total grazing land is 88 percent of the Malheur National Forest, 58 percent of the Umatilla National Forest, and 60 percent of the Wallowa-Whitman National Forest.

Current Forest Plan Direction

The Blue Mountains national forests are currently operating under 1990 land management plans, as amended, which provide the following summarized direction for rangeland management.

- Provide a sustained production of palatable forage for grazing by livestock and dependent wildlife species in a manner consistent with other resource objectives and environmental constraints, while maintaining or improving ecological condition and plant community stability. Rangeland vegetation is managed at levels that meet the basic needs of the plants and soils, the forage needs for wildlife at management objective population levels, and to provide forage for permitted domestic livestock.
- The 1990 land management plans were amended by the PACFISH (USDA 1995a) and INFISH (USDA 1995b) standards and subsequent Biological Opinions from the U.S Fish and Wildlife Service and NOAA Fisheries that required additional monitoring that will need to be carried into the revised forest plans.

Existing Condition

Permitted Livestock Grazing

Livestock grazing is a significant part of the western culture on the Blue Mountains national forests. Although livestock grazing on National Forest System (NFS) lands has decreased since the early 1900s, the ranching industry remains an important part of the local community, culture, and economy. Qualified ranchers are issued permits to graze livestock on designated allotments during late spring,

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summer, and early fall. Grazing on public land is an integral component of overall ranch operations for those with grazing permits.

The Interior Columbia Basin Ecosystem Management Project (ICBEMP) rated rangeland integrity by measuring (1) grazing influences on vegetation patterns and composition, (2) disruptions to the hydrologic regimes, (3) expansion of exotic species, (4) changes in fire severity and frequency, (5) increases in bare soils, and (6) expansion of woodlands into herblands and shrublands (USDA 1996).

Most of the southern end of the Blue Mountains (Malheur and southern Wallowa-Whitman National Forests) as well as the far north (Wallowa Valley Ranger District), were characterized by the ICBEMP as having between 70 to 100 percent low range and ecological composite integrity. Forage conditions have been reduced by woodland juniper encroachment and expansion of invasive weed species. A decline in herb lands and shrub lands was observed. Much of the area was characterized as sensitive to overgrazing and invasive plants.

The majority of Umatilla National Forest and the western portion of the Wallowa-Whitman National Forest (La Grande and Baker Ranger Districts) was modeled by ICBEMP as having 76 percent low range integrity and 58 percent low ecological integrity (USDA 2018, CMSR). Existing conditions have been highly altered from historic conditions by livestock grazing, timber harvest, and exclusion of fire. Historic high levels of grazing combined with climate shifts and fire suppression may have created conditions favorable to the establishment of large numbers of tree seedlings (Halofsky and Peterson 2017).

An evaluation of forage production and utilization was conducted by Countryman in 2011. The results show that at the landscape scale, forage resources are more than adequate for existing and projected future needs of permitted livestock and large wild ungulates while ensuring landscape scale sustainability of rangeland ecosystems. Suitability and capability for grazing within allotments are determined by factors that include canopy cover, steepness of slopes, plant production level, and soil condition (land type associations).

Suitability of areas for livestock grazing is analyzed separately for cattle and sheep. “The Rangelands Capability and Suitability Assessment for the Blue Mountains” was finalized in 2011 (Countryman). Estimates of forage production were based on average production (pounds per acre per year) for each grouping of plant associations. Production figures represent the current vegetation conditions, where many of the forested groups have heavy overstory canopy cover, resulting in lower understory production.

Permitted numbers of livestock or seasons of use have declined slightly in response to the 1990 Plans allowable utilization levels and resolution of resource conflicts. Key big game winter ranges were reanalyzed in 2010 as part of the capability and suitability analysis to determine total forage production and to assure that the allocation of that forage between big game and livestock is appropriate.

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Modified grazing strategies and implementation of utilization standards have resulted in reduced use levels in riparian areas. Riparian systems have benefitted, showing signs of vegetation recovery. Woody shrubs are more prevalent.

Grazing allotment management and allowable utilization levels can be affected by invasive plants, in addition to the requirement for management actions to consider Endangered Species Act listed and other species of concern such as greater sage grouse, wolves, and bighorn sheep. The 1990s forest plans were amended by the PACFISH and INFISH Biological Opinions (PIBO), including the Enclosure B Grazing Guidelines (USDA 1995).

Active grazing allotments cover 68 percent of the Blue Mountains national forests: 91 percent of the Malheur, 59 percent of the Umatilla, and 54 percent of the Wallowa-Whitman. Suitable acres for livestock grazing in active allotments (all land types) cover three quarters of the Malheur, and a quarter each of the Umatilla and Wallowa-Whitman.

Vacant allotments make up about six percent of the Blue Mountains national forests: two percent within the Malheur, two percent of the Umatilla, and twelve percent within the Wallowa-Whitman. Suitable acres for livestock grazing within vacant allotments comprise two percent of the area: three percent each within the Malheur and the Wallowa-Whitman.

Permitted use is used for analysis of the existing condition rather than annual authorized use because of the authorized use variability in annual authorizations. This may vary with permittee personal convenience non-use or resource protection non-use due to wildfires or annual climatic fluctuations effecting available forage and water for livestock.

Active allotments, Permitted livestock numbers, Annual Unit Months (AUMs) and Head Months (HMs) in 2023:

- Malheur National Forest:
    - 92 cattle allotments permitting 27,731 cow/calf pairs (75,078 HMs)
    - 1 sheep allotment permitting 3,880 ewe/lamb pairs (17,604 HMs)
- Ochoco National Forest administered by the Malheur National Forest (USDA 2001):
    - 8 cattle allotments permitting 1,587 cow/calf pairs (4,333 HMs)
    - 1 sheep allotment permitting 1,600 ewe/lamb pairs (6,259 HMs)
- Umatilla National Forest:
    - 30 cattle allotments permitting 7,740 cow/calf pairs (30,532 HMs)
    - 5 sheep allotments permitting 5,525 ewe/lamb pairs (18,877 HMs)
- Wallowa-Whitman National Forest:
    - 82 cattle allotments permitting 13,499 cow/calf pairs (53,104 HMs)
    - 4 sheep allotments permitting 3,369 ewe/lamb pairs (15,118 HMs)

Vacant allotments:

- Malheur National Forest: 2 cattle
- Ochoco National Forest administered by Malheur National Forest: none
- Umatilla National Forest: 1 cattle

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- Wallowa-Whitman National Forest (excludes the Hells Canyon National Recreation Area): 11 cattle & 1 sheep

Rangeland Health

The importance of riparian areas, wetlands, and aquatic resources, enhanced by increased protection of Endangered Species Act listed fish species and habitats, has resulted in implementing intensive grazing management practices. These practices are primarily focused on restoring riparian and stream conditions, along with minimizing or avoiding conflict between permitted livestock and the listed fish species and their habitats. Additional monitoring and adaptive management principles focus on sustaining permitted livestock use while improving aquatic habitats.

Grazing land health and sustainability is defined by the degree to which the integrity of soils and the ecological processes of grazing land ecosystems are maintained in a healthy functional status over time in response to various disturbance processes. The determination of grazing land health depends on the level of soil stability and watershed function, the integrity of nutrient cycles, plant species composition, and the level of disturbance resiliency to site potential.

State and transition models are used to evaluate the condition of rangelands. Models show the range of plant communities possible given the physical rangeland site characteristics, and the “transition” demonstrates the natural or human-caused disturbances that can or have occurred, and what the resulting plant community could be after disturbance. Vegetation was classified along a gradient of increasing departure from pristine, native vegetation (reference conditions) (Johnson and Swanson 2005). Current vegetation survey plots were assigned to phases and states using vegetation attributes and surface cover.

Countryman et al (2012) evaluated continuous vegetation survey plot data and calculated the relative amount of the dry and moist upland grassland potential vegetation groups to phases A, B, C or D. Transitions between states are generally described by biotic thresholds based on vegetation composition. Phases A, and B are used to describe the distinctive plant communities in a state close to reference, which represents the historic range of vegetation dynamics of a site. Phase A is the most resilient plant community within that state and depicts reference conditions. Phase B shows moderate departure from reference conditions. Phases A and B presumed to be capable of ensuring long-term sustainability and resiliency. Phase C is strongly departed from reference conditions. This is the at-risk phase, which is the least resilient and most vulnerable to transition to an alternate state. Phase C is assumed to be of concern but is still likely to allow grazing land to operate within the range of natural variability. Sites with vegetation conditions completely departed from the reference condition are classified as Phase D. This phase represents various alternate states possible for a site. Although there is no direct measure of grazing land health parameters associated with these phases, impacts to grazing land vegetation are often directly correlated to impacts to the soil resource. Therefore, the use of the phases model is believed to be a good representation of soil stability, nutrient cycles, disturbance resilience, plant species composition and health, and watershed function.

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In the Blue Mountains national forests, grazeable forestland sites represent much of the forage production. Within the Umatilla and Wallowa-Whitman, distribution is similar, with 94 and 91 percent in Phases A and B. Within the Malheur, 81 percent is in Phases A and B.

The general condition of rangelands appears more departed from reference conditions than forestlands. Within the Umatilla and Wallowa-Whitman National Forests, Phases A and B rangelands account for 43 and 42 percent, Phases C and D account for 57 and 58 percent. For the Malheur, 28 percent of rangeland is categorized in Phases A and B, 72 percent is in Phases C and D. Most of the Phase C and D rangelands may be the result of activities that pre-date the establishment of these national forests.

Invasive Plant Species

A large portion of the Blue Mountains is characterized as being susceptible to exotic weed invasion (USDA 2005). The susceptibility is tied to areas dominated by dry forest, dry grass, dry shrub, and cool shrub types; which are the types of sites that many invasive species evolved in and are adapted to. The current Forest Plans stated that invasive weed species would be present on the forests but the spread would be controlled. Invasive species are currently still present and increasing in distribution. In 2005, the Pacific Northwest Regional Forester amended all Region 6 Forest Plans, adding new management direction, including emphasis on early detection, and effective integrated treatment of invasive plants. The Umatilla and Wallowa-Whitman National Forests completed Environmental Impact Statements (EISs) in 2010, followed by the Ochoco National Forest in 2012, and the Malheur National Forest in 2015, and in 2016 a Supplemental EIS for the Wallowa-Whitman was completed. Site-specific treatments were analyzed and approved, however, there is a need to set priorities for individual treatments to be more successful at the landscape scale. There is also a concern whether the standards in the Invasive Species EISs will allow successful treatment and prevention of invasive weed species.

Fire and Carbon

Expected recovery potential of rangeland is a function of fire severity. Johnson (1998) reported that in lightly burned areas (low severity fires) the expected recovery is fairly quick, and a natural recovery of one to two years would be expected. Moderately burned areas (medium severity fires) have a modest recovery rate of two to five years. Heavily burned (high severity fires) have a slow natural recovery and may require five or more years to recover.

Rangeland ecosystems generally include natural grasslands, savannas, shrub lands, many deserts, tundra, alpine communities, marshes, or meadows. (McKinley et al. 2022). Most of the carbon in these systems is found belowground in soils and roots. Soil generally provides a stable ecosystem carbon pool relative to other ecosystem carbon pools. However, there are several drivers that can cause rangelands to gain or lose carbon, including fire and grazing. Fire and grazing can greatly impact rangelands by temporarily removing above ground vegetation. When compared to the carbon stocks

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of the total ecosystem, however, the total carbon in rangelands is likely small for the Blue Mountains national forests.

Rangeland carbon stocks are lower than forests and are less directly affected by rangeland management practices than timber harvests in forestlands (U.S. EPA 2011/withdrawn FEIS Vol. 1 Ch 3). Because soil carbon in rangelands is generally stable, substantial changes in carbon pools and fluxes are typically a result of dramatic changes in land use or vegetation cover that persist indefinitely. Managing the health of rangelands and avoiding land use and land cover change are key actions for maintaining carbon stocks. Land-use change generally does not occur on the Blue Mountains national forests, although there is increasing development on private lands in the region.

Key Benefits to People

Livestock grazing includes both social and economic dimensions. Ranching can generate income, but it also holds noneconomic value in tradition and heritage. Most ranchers in the West have an off-ranch job to supplement income.

There has been a shift from a rural economy based on natural resource utilization, to one characterized by tourism development. This change has contributed to economic diversification but has also led to cultural conflict.

Research indicates many ranchers identify the value of ranching as being closer to the earth, providing a desirable place to raise a family, and providing a satisfying way of life. Interaction with other ranchers builds networks and social capital. Such interpersonal relationships contribute to the sense of belonging and quality of life. (USDA 2018, Socioeconomic Technical Reports 2023)

Maintaining working ranches contributes to the preservation of open space. The sale of ranches often leads to conversion of ranchland to sub-divided developments that reduce the availability of open space (USDA 2018). Without access to allotments on the Forest, some ranches may no longer be economically viable. Ranches have an impact on the local economy through an economic multiplier effect. Activity on these ranches requires hiring employees, purchasing materials, and obtaining services paid to other businesses in local communities.

Ecological integrity and sustainability are important parts of the grazing program today. Livestock grazing is likely to be sustained within the planning area over the next 20 years because actions since 1990 have been successful in improving livestock management. Additionally, the emphasis of ecological restoration will contribute to the direct and indirect sustainability of grazing on the Blue Mountains national forests. Flexibility in managing grazing for intensity, duration, and timing should continue to improve overall rangeland conditions. These principles allow for productive lands which are capable of sustaining grazing and other multi-use activities into the future (Socioeconomic Technical Reports 2023).

Increases in atmospheric carbon dioxide over the last century have been linked to rising global temperatures, resulting in climatic changes and associated effects (see Climate Change report).

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Because forest and rangeland ecosystems can remove carbon dioxide from the atmosphere, they can help modulate atmospheric greenhouse gas concentrations and play an important role in regulating climate (IPCC 2023). Carbon storage is an important benefit provided by the forests (see Climate Change report).

Risks and Stressors

Invasive Plant Species

Invasive plant species have generally expanded. Treatments have been limited to site-specific applications except in isolated cases where severe infestations on national forest lands might impact adjacent private lands. Some infestations could become more extensive.

The 1990 forest plans stated that invasive weed species would be present, but with controlled spread. Invasive species are currently still present and increasing in distribution. Invasive plants infest tens of thousands of acres within the Blue Mountains national forests.

Invasive plant species are recognized as a major threat to native plant communities especially on disturbed sites and grasslands. The area impacted by invasive weed species has increased throughout the interior Columbia Basin, including the Blue Mountains, over the last 100 years (Quigley 1996). The same trend for increasing noxious weeds has also occurred in the Blue Mountains national forests over the last 10-15 years. A large portion of the Blue Mountains is characterized as being susceptible to exotic weed invasion (USDA 1996). The susceptibility is tied to areas dominated by dry forest, dry grass, dry shrub, and cool shrub types, which are the types of sites that many invasive species evolved in and are adapted to.

Invasive species are defined by the 1999 Executive Order 13112 as those species that are non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. As such, they are an ecological stressor. Invasive plant species can out-compete and displace native plant species, often completely taking over a site.

Areas most susceptible to invasions are created when vegetative cover is disturbed and exposes bare soil. Land may be disturbed from human use or management, including roads, trails, ditches, agriculture, livestock grazing, timber harvest, prescribed burning, and land clearance. Other disturbances are naturally caused, such as wildfires or concentrated areas of wildlife. Invasive plant species can be spread or introduced into unoccupied areas by wind, vehicles, humans, and animals along travel routes and waterways.

Natural plant community composition can be altered, greatly reducing biodiversity, eliminating habitat and forage for wildlife and livestock, and potentially altering fire regimes. Ecosystem functions such as nutrient cycling and energy flow can be altered. Invasive plants can affect soil characteristics by altering soil chemistry, changing soil moisture levels and evapotranspiration rates, and by lowering water tables.

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Fire Exclusion

Since the time of European settlement, numerous factors, including fire exclusion and suppression, timber harvest, introduction of nonnative plant species, and grazing, have altered the natural fire regimes in the Blue Mountains. Historic levels of livestock grazing reduced ground fuels and grasses that would have normally carried low and mixed severity surface fires. These fires served to naturally thin the forest. Suppression of grass and shrub competition also created conditions more favorable to tree regeneration (see Terrestrial Ecosystems report, Grasslands section).

Exclusion and fire suppression has been a common practice for the Blue Mountains over the last century. This action has many unintentional effects to grazing land vegetation. Without fire and subsequent tree mortality, coniferous tree cover increases, which decreases forage production. On rangelands, sagebrush also increases in density, height, and cover, and outcompetes native herbaceous cover without fire in the ecosystem (Quigley et al. 1997). Likewise, the absence of fire increases the population, abundance, and range of Western Juniper (Juniperus occidentalis), a species known for its ability to capture precipitation while creating monocultures of trees with a reduction of forage production at the ground level.

Climate Change

Climate change is an ecological stressor (see Climate Change Report). It has direct impacts on ecosystems through changes in precipitation and temperature, in addition to indirect effects from its influence on the frequency, extent, and severity of landscape disturbances such as wildfires and insect outbreaks. Related to this are weather-related stressors such as droughts, floods, and wind events that may be more common or intense with a changing climate.

While grazing practices and rangeland condition have improved substantially over the past several decades, the legacy of high historical livestock levels and associated activities still impacts the current ecological integrity of some ecosystems in the Blue Mountains. For example, past grazing reduced fine fuels and contributed (along with active fire suppression) to low levels of fire in some ecosystems, particularly the dry upland forests.

Rangeland systems may serve as an early indicator of climate change due to the dominance of grasses and forbs since they are more sensitive to annual climate variability compared to forestlands. Increased disturbance from more frequent extreme droughts amplifies conditions that favor wildfire, insect outbreaks, and invasive species.

Climate change is expected to increase the impacts of invasive plant species (Chambers et al 2008). If established, any invasive plant species can increase in abundance or expand into lower elevation grassland, shrubland, and open woodland communities. This can occur regardless of disturbance levels as these communities become warmer and drier. In addition, the rate and magnitude of infestation will likely increase with greater disturbance levels (such as increased fire intervals) that are expected with a changing climate (Halofsky and Peterson 2017).

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A warmer climate will cause an increase in the frequency and extent of wildfire in most dry forest and shrubland ecosystems. By around 2050, the annual area burned in most of the Western United States is projected to be at least two to three times higher than it is today. The Blue Mountains eco-province is also expected to experience increased area burn by the mid 21st century. Recent research shows that the occurrence of large fires in the Western United States has increased since around 1980. Many dry forests that have not burned for several decades have high fuel accumulations, and initial fires may cause uncharacteristic tree mortality compared to low levels of mature tree mortality associated with historical surface-fire regime. If these areas recover as forested ecosystems, recurrent fires (if allowed to burn, and are not suppressed) may more closely resemble the frequency characteristic of pre-settlement, low-severity fire regimes. However, in the driest portions of the Blue Mountains, it is possible that these areas will not recover to forested conditions, and uncharacteristic fires combined with climatic warming could initiate a transition to shrub- or herb-dominated ecosystems (Halofsky and Peterson 2017).

Active management on certain public lands—wilderness, riparian habitat conservation areas, designated old growth, lands with endangered species—may be severely restricted owing to regulations, thus limiting mitigation of known risks. Disturbances, which have always been a dominant influence on the dynamics of forest ecosystems in western North America, will be even more important if climate change leads to increased frequency and magnitude of extreme weather. In most cases, strategies should be developed that allow us to manage with increasing disturbance and stress in forests, especially as the climate continues to warm. Active management and planning in anticipation of these changing conditions can reduce risk and the severity of short- and long-term hazards (Halofsky and Peterson 2017).

Trends and Drivers

Current trends for riparian and aquatic species and habitats were assessed using data from regional-scale effectiveness monitoring. Protocols were developed in response to requirements of biological opinions for the 1990 forest plans, as amended by PACFISH and INFISH Biological Opinion (PIBO) (Archer et al. 2009, Archer and Ojala 2016).

Passive restoration of riparian and aquatic habitats through natural processes appears to be occurring within NFS lands (Archer et al. 2009). Riparian and aquatic conditions are currently trending upward at the scale of the plan area, following over 25 years of management under PIBO.

Vegetative variables are improving at a faster rate than physical habitat (channel) variables. Repeat monitoring shows little difference in effective ground cover between reference and managed sites. However, greenline cover was greater at the reference sites due to more nonnative plant cover at the managed sites.

Aquatic and riparian habitat conditions across the Malheur National Forest are generally improving or showing non-significant trends depending on the indicator, based on PIBO trend monitoring (Archer and Ojala 2016a). PIBO monitoring at integrator sites across the Umatilla and Wallowa-Whitman

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National Forests indicate most riparian and aquatic habitat indicators are showing non-significant trends or changes (Archer and Ojala 2016b and 2016c).

Overall, PIBO monitoring tends to show a more stable riparian condition at the reference sites. While certain parameters recorded lower values at the managed sites relative to the reference sites, the raw data shows that sites open to livestock grazing were improving in the presence of managed livestock grazing. With localized exceptions, riparian areas in the Blue Mountains have improved and are trending toward continued recovery (Archer 2016 a-c). Much of the recovery to date has occurred in terms of riparian vegetation while recovery in stream morphology is trending slower and more localized. This is partly due to the nature of the processes involved, but also due to the multiple impacts affecting stream hydrology (roads, livestock, fire management, recreation). In most cases, recovery has occurred in the presence of intensively managed permitted livestock. Some areas of concern remain, but these are usually relatively localized and can be dealt with through improved management, or in some situations by excluding livestock.

Saunders et al updated the stream habitat condition for sites on the Blue Mountains national forests in 2023. The results of these reports are located in the draft Aquatic, Wetland, and Riparian Ecosystems Assessment report. The summary indicates the three streambank related metrics were mostly stable or improving across the Blue Mountains, except for bank angle on the Wallowa-Whitman and bank stability on the Umatilla. Again, precipitation and streamflow conditions during the monitoring period could influence these trends.

Findings from 50 years of photographic and vegetation sampling within subalpine grassland ecosystems in the Blue Mountains followed the ecological recovery of sites that had been degraded by early 20th century unregulated grazing (USDA FS FEIS 2018). They found that in general there had been substantial improvement in ecological status with increases in native grass species and ground cover that should prevent accelerated soil erosion. While substantial improvement has occurred, there is still a need for restoration of the grassland ecosystem.

Change detection using repeat photography by Skovlin and Thomas (1995) documents long-term changes that occurred on a variety of Blue Mountains vegetation types (USDA FS FEIS 2018). Original photo series were taken prior to 1925 and repeat photos were taken in 1992. Shifts from grassland to shrub steppe-juniper woodland were observed. Canyon lands were in fair condition and appeared stable. The valley grasslands had improved in general and appeared stable. Foothills surrounding the Blue Mountains were found to be in poor to good condition with an upward trend in forage values and watershed stability, with an increase in juniper encroachment (USDA FS FEIS 2018). Mountain grasslands showed increases in conifer encroachment but remained in fair condition and stable. Mountain meadows in general showed improvements in native species composition, though there were some that had not improved in 75 years (USDA FS FEIS 2018). Subalpine grasslands showed increased conifer encroachment. Another photographic comparison shows increase in conifer encroachment onto grasslands (Skovlin et al. 2001).

Forage conditions on grazeable rangelands and forestlands have been evaluated using condition and trend monitoring. Data from monitoring transects serves as indicators of general rangeland

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conditions in the Blue Mountains national forests. During the 1950s, average forage conditions were poor to very poor (planning record). These forage condition ratings steadily improved in the 1990s. From 2000 to 2004, forage conditions improved significantly, with 39 percent of sites reported in poor to very poor condition. The rate of improvement has slowed for the last 30 years, having a static trend. Very few plots exhibit a declining trend.

Rangeland vegetation recovery trends have slowed. Some sites, primarily foothills impacted by nonnative plant species, and certain high elevation sites where historic impacts have exceeded a threshold, would continue to remain in poor to fair range condition (corresponding to the early to low mid-seral status or Phase D). It is likely that upland rangeland conditions will continue their improvement on most sites under current management. This improving trend could be impacted or even be reversed by invasive species, or by climate change in the long term. Conifer or other woody vegetation encroachment and overstory canopy cover would be expected to continue at a relatively unchanged pace, continuing to impact grazing land health.

The rangeland condition is expected to remain unchanged, since recovery of native species on rangeland appears to have stabilized during the last 10 years (Countryman and Swanson, planning record). Poor condition rangelands (Phase D) are not expected to change without intensive rehabilitation.

The vegetative composition would be expected to maintain the desired condition and upward trend, in part due to the Invasive Plant Environmental Impact Statements and Record of Decisions on all four forests (2010, 2012, 2015, 2016), which authorize a greater number of herbicides and area of use to reduce competition with native plants. However, lack of funding or personnel to treat the invasive plants is trending toward invasive plant populations increasing quicker than can be treated annually.

Information Needs

Permitted livestock numbers and allotments were obtained from the Rangeland Information Management System (RIMS) reporting database for 2023. It appears not all the allotments on the Blue Mountain Ranger District of the Malheur National Forest were included in the previous analysis (USDA FS FEIS 2018). Statuses of some of the allotments have changed since 2013 and have been updated to the 2023 statuses and AUMs or HMs. Because there are allotments which have become active, vacant, or closed since 2013 the suitable acres for the allotments needs to be reanalyzed.

There is a need to reevaluate the current conditions of upland and riparian areas. There may be a better way to evaluate the range of conditions within the entire area (upland and riparian) of the allotments. For example, new monitoring protocols, databases, and data collected.

More ecological trend data in all biophysical environments may be needed to assess whether the current utilization standards are adequate to protect the resource or indicate condition and trends. This long-term data collection usually occurs during the grazing authorization NEPA for the allotment,

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but the Blue Mountains national forests haven't had the capacity to take on the quantity of range NEPA necessary.

The methodology for determining range capability and suitability needs to be adhered to on the Blue Mountain national forests for consistency.

There is a concern that the forests should switch from the current range single pathway successional model to the concept of "state and transition" models which recognizes multiple successional pathways depending on the type of disturbance and environmental conditions present on the site. More specific desired conditions based on the different potentials for different shrub, forest, and grassland plant communities may be better than the current overall desired condition.

In regard to invasive plant species, there may be a need to set priorities for individual treatments to be more successful at the landscape scale. A concern also remains whether the standards in the Invasive Species EISs will allow successful treatment and prevention of invasive weed species.

There is a need to update the acres of invasive plant infestations for each forest, as well as the number of species.

Key Findings

Livestock Grazing - While grazing practices and rangeland conditions have improved substantially over the past several decades, the legacy of high historical livestock levels and associated activities still impacts the current ecological integrity of some ecosystems in the Blue Mountains. For example, past grazing reduced fine fuels and contributed (along with active fire suppression) to low levels of fire in some ecosystems, particularly the dry upland forests.

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