

4.8 Northern Basin and Range Ecoregion

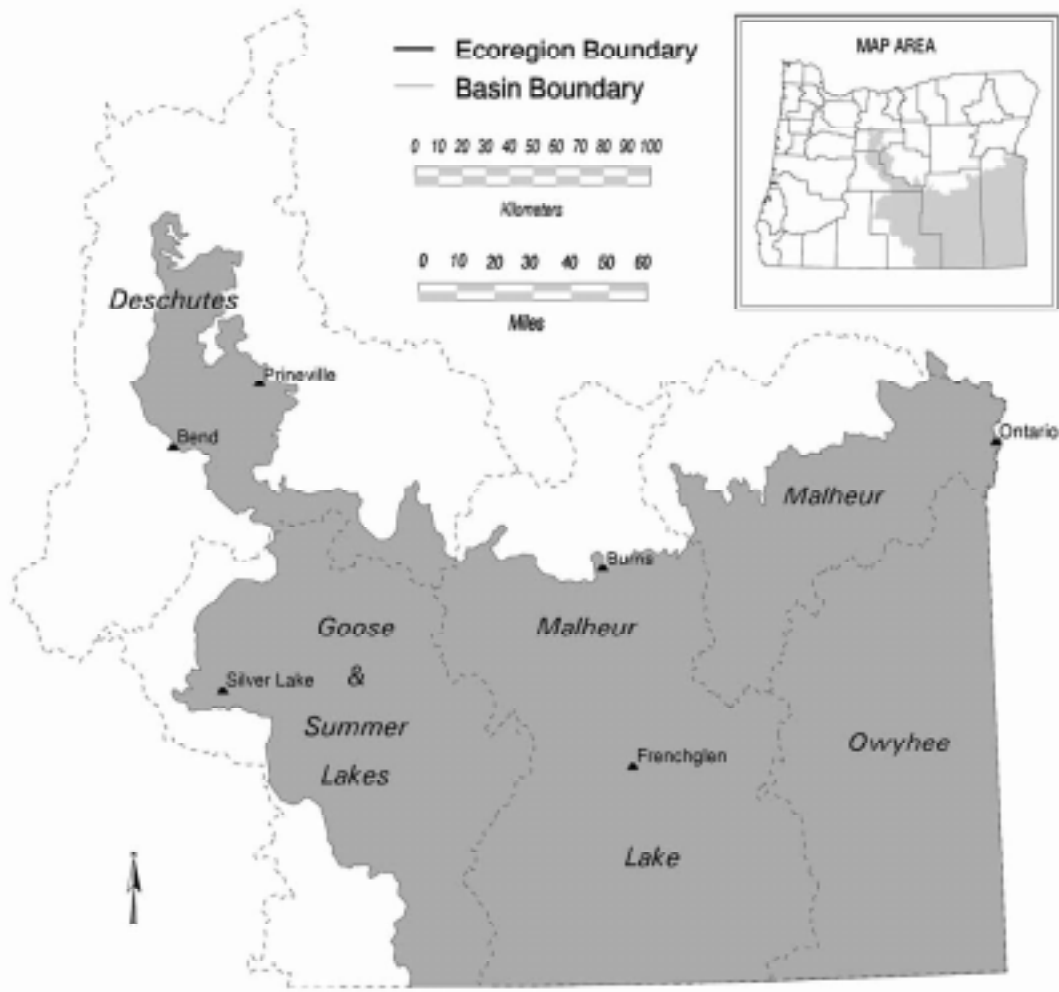
Description

The Northern Basin and Range ecoregion includes much of southeastern Oregon, including its high desert and the volcanic highlands of the Owyhee and Malheur watersheds (Figure 4.8-1). This is a region with very little rainfall. Much of the landscape is open and treeless, and because of competition for water, plants are widely spaced and soils are exposed to the elements. Yet Oregon's high desert contains some of the largest wetland systems in the American West.

The region's wetlands provide critical habitat for a wide variety of fish and wildlife. The size and extent of the region's wetlands fluctuate widely from season to season and year to year, depending on precipitation patterns. Isolated from each other for tens of thousands of years, individual basins have

developed high levels of endemism with species found nowhere else in the world; seventeen species of fish listed as sensitive, threatened and endangered are found in the region's shallow lakes and springs. Marshes around Malheur Lake (50,000 acres at high water levels)—the largest natural freshwater marsh west of the Mississippi—and other lakes support the largest inland nesting colonies of waterbirds in the state. The wetlands of the Warner Valley and Summer and Abert Lakes attract tens of thousands of migrating shorebirds and waterfowl and provide breeding habitat for as many as 100 bird species. Harney basin wetlands, private lands used for hay and cattle production, draw peak numbers of up to 2.5 million ducks, 100,000 snow geese and 16,000 lesser sandhill cranes during the spring migration.

Figure 4.8-1. Northern Basin Ecoregion and Associated River Drainage Basins



Current Condition

The region remains the least populated part of Oregon, largely rangeland in public ownership (Figure 4.8-2). Livestock grazing was until recently thought to be the only viable land use in this region. However, the open spaces, scenery, solitude, and wildlife now draw people to the area. Consumptive recreation (hunting and fishing) has long been a part of the region and has now been joined by an increase in non-consumptive uses such as bird-watching, hiking and the search for solitude. Parts of the region have become renowned for outdoor sports, such as rock climbing at Smith Rocks and whitewater sports on the Owyhee River.

Upland ecosystems

The economy here was built on grazing and agriculture. Livestock began moving into eastern Oregon around 1861. Numbers of cattle, sheep and horses increased dramatically and grazing continued unabated until 1934. Dryland crop production was attempted throughout the ecoregion wherever soils were deep enough to be plowed.

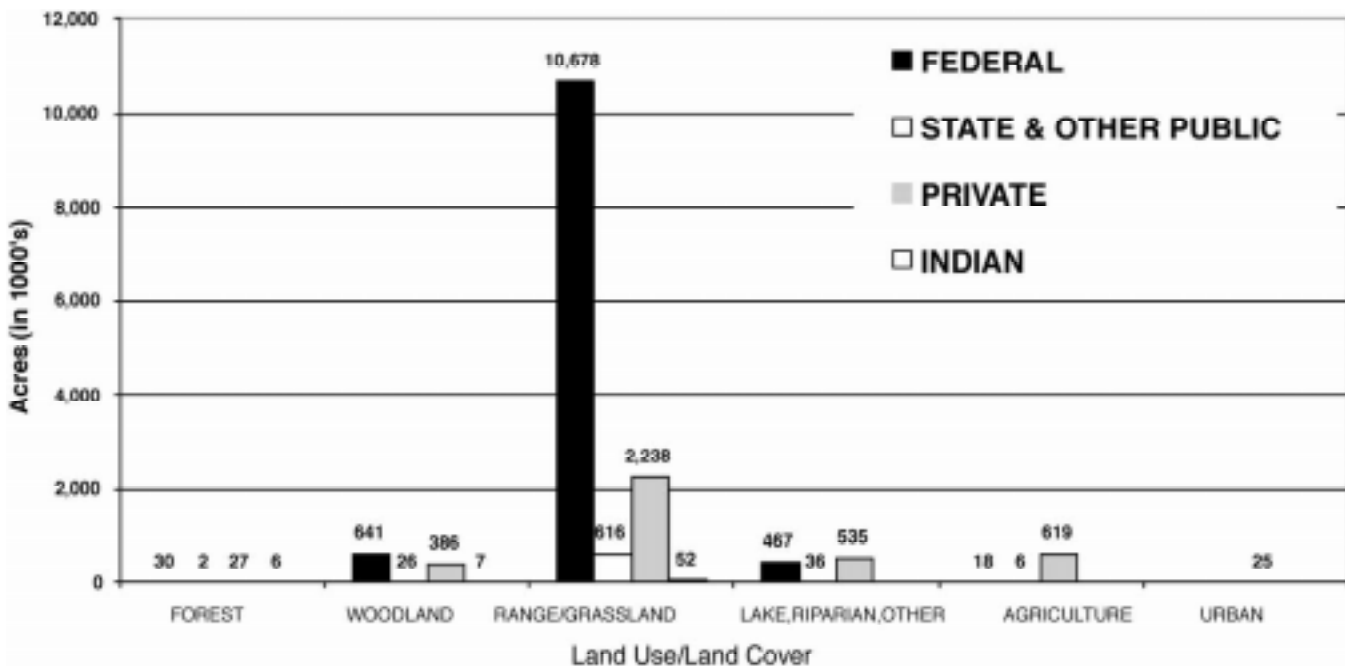
Overgrazing by livestock during this period caused immediate changes in vegetation and also set in motion long term changes in natural community structure. An immediate impact was the reduction of grasses to carry fire, a common natural event and a management practice of native Americans. Less grass and fewer fires resulted in a rapid increase in sagebrush and a gradual extension of juniper. Historically, periodic fires had limited juniper to rocky ridgetops, shallow soils or areas of sparse vegetation. Today, junipers dominate many

parts of the landscape, invading and outcompeting other plant communities for available water. Big sagebrush types are dominated by old stages and need fire to change plant composition and increase diversity. However, cheatgrass present in some of drier communities may preclude prescribed fire. Cheatgrass found excellent seed beds on the historically overgrazed ranges and spread rapidly in some sagebrush communities.

Unregulated grazing on public lands came to an end in 1934 with passage of the Taylor Grazing Act. Yet the thought persisted that grazing was the only viable use for this ecoregion and much of the West. For many years, lands were managed for sustained livestock production with little thought to other resources. Today, management emphasis on public lands has shifted away from projects that enhance livestock production. Although parts of the ecoregion are still heavily impacted by livestock grazing, invasion of exotic plants, fire suppression, and other human influences, the region retains much of its native biodiversity. Research indicates that livestock grazing systems can be put in place that either have negligible detrimental effects on the environment or can enhance habitat characteristics for targeted wildlife.

The ecoregion contains many diverse habitats. The most significant of these are the sagebrush steppe types, riparian and wetland types, as well as western juniper, mountain mahogany and aspen woodlands. The driest, most desolate looking mix of plant communities in the ecoregion are those that comprise the salt desert scrub, located where lack of drainage has

Figure 4.8-2. Land Use/Land Cover by Owner for Northern Basin and Range Ecoregion



Cattle and Fish

Beginning in the 1980s, advocacy in the management of public lands in the West has risen dramatically; Eastern Oregon is no exception. Often that activism has come in the form of litigation. However, in several situations, working groups were formed to develop new directions in management agreeable to all participants. One of the most successful examples is the Trout Creek Mountain Working Group formed in 1989 to address the serious concerns of riparian conditions and the status of the Lahontan cutthroat trout, a threatened species. The group formed a plan that halted grazing on the Trout Creek Mountains for five years by providing alternative forage on both private and public lands. After the five years, a new grazing plan was put in place to minimize any grazing damage to riparian areas. The plan was a success and the Working Group still serves as a model throughout the West for positive action and conflict resolution.

Experiments at the Trout Creek Mountains have shown that some grazing management practices can improve the condition as well as the productivity of the landscape. For example, grazing on uplands during late summer provides little nutrition for cattle, and contributes most to overgrazing in the riparian zones. It is tradition, not economics, that keeps this practice going. By moving cattle off rangelands during this time, both cattle and rangeland condition improves.

There are places in the region where natural structure and function and sustained productivity are compatible, where cattle and natural landscapes can coexist. Experiments have been undertaken by Bureau of Land Management with promising results. However, scattered successes do not add up to a regional plan, which is what the ecoregion needs.

built up salts in the soil. These areas can be practically devoid of vegetation, or may have sparse shrub cover of greasewood, spiny hopsage, or saltbush. The presence of microphytic crusts is an important indicator of health of this ecosystem.

Aquatic ecosystems

As winter snow packs melt and spring rains result in runoff, water typically collects in the region's few streams or gathers in low-lying areas, called playas. These playas vary from salt encrusted bare soils to productive seasonal wetlands. Larger valleys were once a mosaic of still, open water, short grass wetlands, heavily vegetated wetlands and flowing water. Small springs and seeps dotted the landscape, whose combined effect provided water and succulent vegetation for a myriad of wildlife species. Today, there is often livestock use of these smaller playas, wet meadow, and seeps. Minor wetlands, although abundant on the landscape, are often altered for use by livestock.

Many of the major wetland complexes within this arid ecoregion (Warner Wetlands, Malheur National Wildlife Refuge, Summer and Abert lakes) are managed for waterfowl production by state, federal, or private agencies although most wetlands are still privately owned. Management for wildlife production may sometimes be incompatible with the restoration of historical patterns of flooding on these wetlands. The dynamic, multi-channeled wetlands and floodplains of historical times have been altered to deep permanent pools and channels. Flooding in these managed areas now occurs sooner than historically and, due to drainage, so too does drying.

Flood-irrigation of hayfields may have increased the extent of wetlands from historical times, increasing the extent of

foraging areas, particularly during spring. The process of cutting and haying these expansive areas as they dry, however, kills nesting species and reduces the amount of rearing habitat available for others.

Historically, playa lakes were wet during winter and spring and dried as summer approached. Some have been altered by dug-out pools for livestock watering. In dry years water is no longer spread out over a large area, but concentrated in a deep pool that affects less area. There is often livestock use of smaller playas, wet meadow, and seeps. Minor wetlands, although abundant on the landscape may be altered by livestock grazing (see Chapter 3.8 Rangelands).

Water remains the limiting factor in this arid region. Declines in riparian condition and water quality occurred during the heaviest grazing early in the 20th century. The reforms of the 1930s which did so much to reverse upland degradation, did not help riparian areas. The trend in water quality shows no improvement, although there are areas, primarily fenced enclosures, where riparian conditions have dramatically improved.

Water quality in streams in this ecoregion is the lowest in the state, generally measured as poor or very poor. It may be important to note that the Oregon Water Quality Index was not developed to weigh regional differences, particularly where evaporation is high and one would expect higher concentrations and temperatures. It is difficult to determine the range of historical conditions in this ecoregion.

Surface water in this ecoregion is fully allocated. Because of dams, storage here is higher than any other ecoregion, and releases from dams keep instream flows close to required mini-

Socioeconomic Profile of the Northern Basin and Range Ecoregion

For the purposes of this report, the Northern Basin and Range region contains Crook, Harney, Lake, and Malheur counties. Overall, the region has seen smaller gains in population and employment growth than statewide. Income and wages in the region are relatively low and have been stagnant in recent years.

The region is rural, with few residents spread across a wide area (2.3 residents per square mile). Despite the small numbers, the region's total population grew slightly slower than the statewide (+15%) growth rate. Lake County, beset by economic difficulties borne of its dependence on the struggling timber industry, grew far slower than the state as a whole.

While statewide jobless rates have been under three percent for the past three years, the jobless rate in the Northern Basin and Range region has been much higher, largely due to the seasonal nature of the region's economy. During the 1990s, the Snake River region saw a sharp drop in resource-based manufacturing jobs, principally wood products and food processing, losses that were not offset by growth in nontraditional manufacturing industries. Interestingly, the government sector has accounted for a good portion (40%) of the job gains in the region since 1990. Much of the growth is related to opening of the Snake River Correctional Institute in Ontario, and general growth of local education districts. At the same time, higher-paying jobs in the resource-related federal agencies have declined by 16 percent.

Agriculture is a key industry in the region. Like other rural areas of the state, farm proprietors' income has historically been an important source of income. But since the mid-1970s, farm income, as a percent of total income, has fallen off sharply and now accounts for little more than two percent of total personal income.

mums. There are local groundwater problems in Malheur and Ontario areas.

Fish have a hard life in the desert. As a result, desert fish species tend to be tough and resilient, although isolated. There are several species endemic to desert lakes. Even stream species tend to be resident in isolated reaches or pools. These species can weather extremes in their local habitat, but they have little or no means to relocate if their habitat is destroyed. So even hardy fish are at risk when the water is removed and habitats are destroyed. Additionally, there are many introduced fish in this region that compete for the limited habitat available, or directly prey on resident native species.

Key Resource Issues

Changes in landscape structure and function

The importance of vegetated riparian areas in the region greatly outweighs their representation in the landscape as a whole. They provide a vital service in creating shade for aquatic and terrestrial organisms and in protecting streambanks from erosion during spring runoff events that can cause severe downcutting on sparsely vegetated soils.

Many of the region's historical wetlands and riparian areas have been converted to agriculture or have been degraded through water diversions and grazing. Recovery will require restoration of hydrologic processes in places where a remnant of the natural community still survives. Mobile species will

likely respond to hydrologic recovery, but it is much more difficult to recover resident sessile species. Therefore we should expect different responses to restoration.

Sagebrush-steppe is the most extensive ecosystem type in the ecoregion. Once heavily damaged by overgrazing, it is recovering, and more can be restored by adjusting grazing practices (timing, duration, location). Grazing pressure affects different parts of the landscape in different ways. Improper grazing is particularly destructive in wetland and riparian areas. Microphytic crusts are important on upland communities not associated with fire.

Juniper management and removal should include strategies for saving the oldest trees which preceded the recent spread of juniper. Some of the oldest trees in Oregon are junipers in this ecoregion, and cutting stands of juniper can inadvertently bring down 400-year-old trees.

Changes in biological structure and composition

Changes in riparian areas have reduced the health of streams in the region. Numbers of redband trout, a resilient widespread species, have been reduced considerably due to impacts from grazing. Livestock grazing pressure comes primarily from cattle, although there are wild horses, pronghorn, mule deer and increasing herds of elk. Elk have grown more numerous than historical averages due to land management practices that have increased forage.

More than 145 species in southeastern Oregon depend on tall sagebrush-bunchgrass communities. Much of this community type has been converted to agriculture along the Malheur and Snake rivers. In other places fire suppression has increased the relative density of sagebrush and diminished bunchgrasses. This has had a negative impact on many native species, including sage grouse, a species of current concern.

The invasion of exotic plant species threatens ecological integrity of the ecoregion, both in upland and in wetland and riparian areas. Many nuisance species are already firmly established, and will require better coordinated, higher priority effort to remove them from the landscape. An ecological approach will help managers understand what land practices are encouraging the introduction and spread of harmful weeds and which ones may reduce or prevent invasion.

Measures of goods and services

Improvements to the health of upland rangeland suggests that grazing can be managed sustainably in many parts of this ecoregion. However, conflicts still occur in riparian areas, where long-term degradation has impacted water resources. Water quality in this ecoregion is among the poorest in the state.

There are approximately 250,000 acres of irrigated crops in Malheur County, where major crops include potatoes, onions, sugar beets, and wheat. Intensive use of fertilizers, herbicides, and irrigation during the 1960s through the 1980s led to groundwater contamination. In 1989, northeastern Malheur County was designated Oregon's first Groundwater Management Area by Oregon Department of Environmental Quality. Since then, improved agricultural practices have helped to reduce leaching and groundwater quality is beginning to improve.

Strengths and threats

The Northern Basin and Range is unique in being the largest and the least populated ecoregion in Oregon. With the exception of the Ontario area, this ecoregion has escaped intensive agriculture, urbanization, and other relatively permanent forms of land conversion. Much of its biodiversity is retained. Many people are beginning to discover the spectacular panoramic landscape of this ecoregion.

Demonstrations at Trout Creek Mountains and elsewhere suggest that restoration of natural landscape structure and function can occur without elimination of traditional resource-based economies. Various private and governmental programs provide an active education program for grazing management for riparian areas.

Significant portions of the region's major wetland systems are managed for wildlife on state and federal refuges and special management areas at Summer Lake, Lake Abert, Warner Valley and Malheur and Harney lakes. Extensive federal lands in this ecoregion support large populations of pronghorn antelope, bighorn sheep, and increasing numbers of elk, as well as sage grouse, white pelicans, and waterfowl.

Rangeland in Oregon is recovering from past abuses. Yet today many unique natural communities are threatened, including aspen, mountain mahogany, and bitterbrush. Threats include suppressed fire, invading junipers, and increased herbivory.

In all ecosystems, weeds and other nuisance species may threaten native communities and alter fire cycles. As we try to reintroduce natural disturbance to ecosystems, the threat of weed invasion increases if seed sources are present.

The condition of riparian areas in this ecoregion is generally poor. In most cases, improvement will require limiting or removing livestock for a period of recovery, followed by good grazing practices, including provision of alternative water supplies and proper timing and duration of grazing. Many riparian areas here fall under the purview of Senate Bill 1010. Streamside riparian areas are receiving the highest priority for protection, while other small non-riverine wetlands command less priority. The ecoregion's water quality problem has been recognized, but not yet fixed. The Bureau of Land Management and Forest Service have developed a National Riparian Team headquartered in Oregon to provide an active education program for riparian management.

Conclusion

The ecoregion faces challenges from the invasion of exotic weeds and juniper and the need to restore water quality and riparian condition. Management activities may be costly and difficult in the short-term.