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Northern Basin and Range Ecoregion

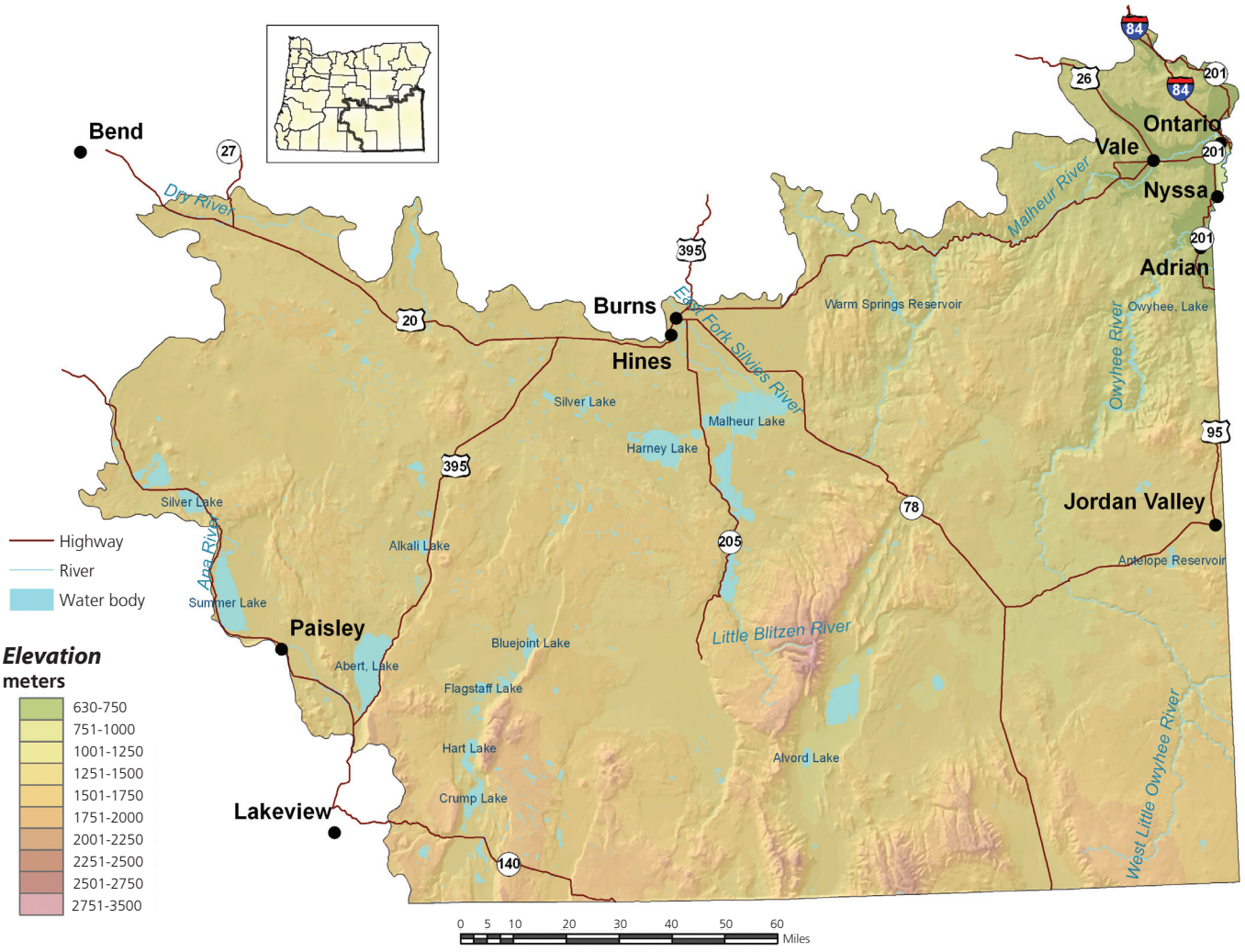
Getting to Know the Northern Basin & Range Ecoregion

Description

The Northern Basin and Range ecoregion is sagebrush country. It is Oregon's slice of the Old West, with rich ranching and farming traditions.

The Northern Basin and Range ecoregion covers the southeastern portion of the state, from Burns south to the Nevada border and from Christmas Valley east to Idaho. The name describes the landscape: numerous flat basins separated by isolated mountain ranges. Several important mountains are fault blocks, with gradual slopes on one side and steep basalt rims and cliffs on the other side. The Owyhee Uplands consists of a broad plateau cut by deep river canyons. Elevations range from 2,070 feet near the Snake River to more than 9,700 feet on Steens Mountain.

In the rain shadow of the Cascades Mountains, the Northern Basin and Range is Oregon's driest ecoregion and marked by extreme ranges of



"At a Glance"- Characteristics and Statistics

Land use (% of ecoregion):

Agriculture	2.5%
Forest and woodland	0.1%
Other (lakes, wetlands, cliffs, etc.)	8.9%
Range, pasture, and grassland	87.9%
Towns and rural residential	0.2%
Urban and suburban	0.5%

Land ownership:

Private	20%
Public, federal	75%
Public, state and local	4%

Human population, government and transportation statistics:

Estimated population in 2000	40,000
% of Oregon's population in 2000	1.4%
Number of incorporated cities	9
Number of counties	6
(includes parts of Baker, Crook, Deschutes, Lake, Harney and Malheur counties.)	
Number of watershed councils	5
(A watershed council is considered present if at least 10% of its area is located within the ecoregion.)	
Miles of road (approx. miles)	28,700

Economics:

Important industries: Livestock, forest products, agriculture, food processing, recreation.

Major crops: alfalfa, wheat, hay, corn, oats, onions, sugar beets, potatoes.

Important nature-based recreational areas: Alvord Desert, Dunes, and Lake; Diamond Craters Natural Area; Hart Mountain National Antelope Refuge; Lake Abert; Malheur National Wildlife Refuge; Owyhee Lake and River; Steens Mountain Wilderness Area and Steens Mountain Cooperative Management and Protection Area; Summer Lake and Summer Lake Wildlife Area; Silvies River.

Ecology:

Average annual precipitation (1961-2000)	7.6" (Rome) - more than 40" (Steens Mountain), most areas average <15"
Average July high temperature (1961-2000)	86.4ºF (Ironside) - 95.7ºF (Ontario)
Average January low temperature(1961-2000)	14.7ºF (Danner) – 21.8ºF (Owyhee Dam)
Elevation	ranges from 2,070 feet (Snake River) to 9,733 (Steens Mountain)
Number of regularly occurring vertebrate wildlife species	345
Important rivers	Donner und Blitzen, Malheur, Owyhee, Silvies

Information Sources: Oregon Blue Book (2003-04), Oregon Climate Service data (1971-2000), Oregon State of the Environment Report (2000), Oregon Watershed Enhancement Board (2001), Oregon Wildlife Diversity Plan (1993), U.S. Census Bureau (2000).

Photo © Bruce Newhouse

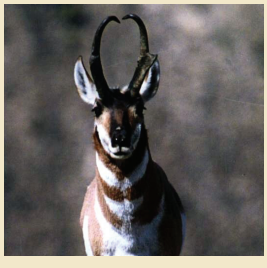
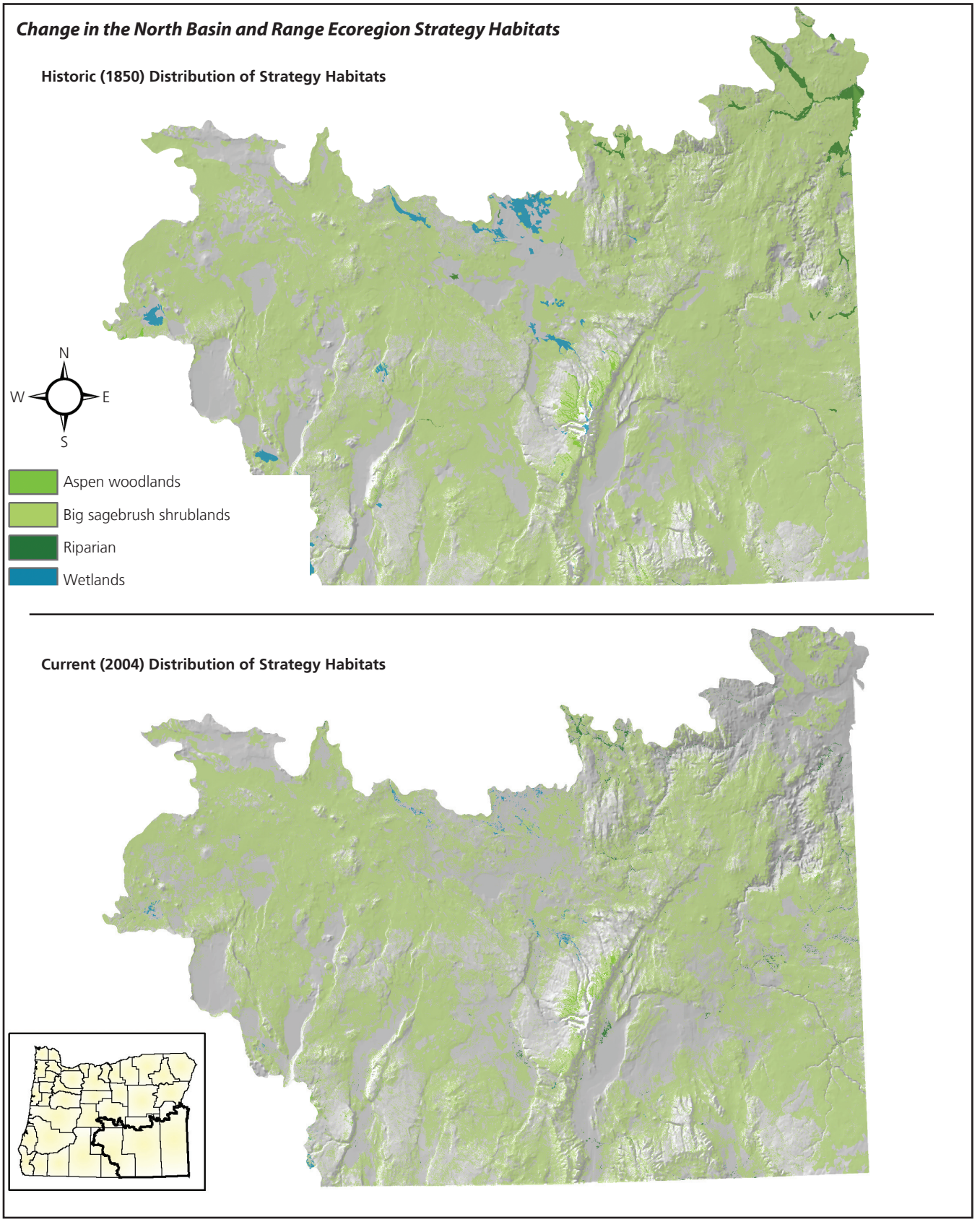


Photo © Jim Ward

Summary List of Strategy Habitats

Strategy Habitats in the Northern Basin and Range Ecoregion include: sagebrush shrublands (particularly big sagebrush habitats), aspen woodlands, riparian, wetlands, and aquatic habitats.

Change in the North Basin and Range Ecoregion Strategy Habitats



Data Source: Oregon Natural Heritage Information Center, 2004.

daily and seasonal temperatures. Much of the ecoregion receives less than 15 inches of precipitation per year, although mountain peaks receive higher amounts, 30-40 inches per year. The extreme southeastern corner of the state has desert-like conditions, with an annual precipitation of only 8-12 inches. Runoff from precipitation and mountain snowpack often flows into low, flat playas where it forms seasonal shallow lakes and marshes. Most of these basins contained large deep lakes during the late Pleistocene, between 40,000 and 10,000 years ago. As these lakes, which don't drain to the ocean, dried through evaporation, they left salt and mineral deposits that formed alkali flats. They are extremely important stopover sites for migratory shorebirds due to the rich source of invertebrate prey.

Sagebrush communities dominate the landscape. Due to the limited availability of water, sagebrush is usually widely spaced and associated with an understory of forbs and perennial bunchgrasses such as bluebunch wheatgrass and Idaho fescue. Isolated mountain ranges have few forests or woodlands, with rare white fir stands in Steens Mountain and Hart Mountain. However, aspen and mountain mahogany are more widespread. For example, the Trout Creeks, Steens Mountain, Pueblo Mountains, Oregon Canyon Mountain, and Mahogany Mountains are excellent sites for finding both mahogany and aspen. In the southern portion of the ecoregion, there are vast areas of desert shrubland, called salt-desert scrub, dominated by spiny, salt tolerant shrubs. Throughout the ecoregion, soils are typically rocky and thin, low in organic matter, and high in minerals.

Northern Basin and Range is sparsely inhabited, but the local communities have vibrant cultural traditions. The largest community is Ontario with more than 11,000 people. Other communities include Nyssa, Vale, Burns and Lakeview, with 2,400 to 3,100 people each. Land ownership is mostly federal primarily administered by the Bureau of Land Management. Livestock and agriculture are the foundations of the regional economy. Food processing is important in Malheur County. Recreation is a seasonal component of local economies, particularly Harney County. Hunting is particularly important, but wildlife viewing, whitewater rafting, and camping are popular. Historically, lumber processing and harvesting from the nearby Blue Mountains was an economic basis of some local communities, particularly for Burns. However, these industries have declined with lower harvests from neighboring federal forests.

Conservation Issues and Actions

Overview

Uncontrolled livestock grazing in the decades before enactment of the Taylor Grazing Act of 1934 caused serious long-term ecological damage throughout the ecoregion. Rangeland conditions have substantially improved since then in most areas, and grazing is managed sustainably in many parts of the ecoregion. However, some areas are still impacted. In addition, sensitive areas, such as riparian habitats and arid areas of sagebrush and salt desert, have been slow to recover.

Greater sage-grouse and comprehensive planning efforts

In Oregon, the greater sage-grouse has brought together an extraordinary range of people, organizations and species to focus on how to maintain sagebrush habitat. Perhaps the best example of a species that might help protect other species associated with the same habitat, the greater sage-grouse is considered a good indicator of sagebrush habitats and of many other species – including the sagebrush lizard, sage sparrow, sage thrasher, Brewer's sparrow, pygmy rabbit, and many plants and invertebrates. The greater sage-grouse possesses many of the traits that biologists look for in an "umbrella" species: it is easily observed, has well-understood biology (including requirements for breeding, nesting, and wintering), and requires a large and diverse home range covering many native grasses and forbs. Recent comprehensive efforts to assess the conservation status of the greater sage-grouse in Oregon, and other states, have contributed to federal decisions not to list the species under the provisions of the Endangered Species Act. Partners involved in the conservation assessment include federal (USFWS – Partners for Fish and Wildlife; BLM; NRCS), state (e.g., ODFW; ODSL) and private groups (e.g., TNC; OHA; landowners). The conservation assessment has support from the Western Governor's Association and the Western Association of Fish and Wildlife Agencies, and integrates analyses across the greater sage-grouse's entire distribution. Oregon's assessment synthesizes decades of information on population trends. In Oregon, vital information about populations is obtained from three independent measures of population trend. Each spring, counts of males at breeding grounds (leks) provide a basis for population size. Also, brood routes are driven each summer to evaluate productivity of nesting females. Lastly, every year, successful hunters submit wings that are measured and evaluated at "wing-bees," providing vital information on individual attributes and populations. Overall, results of the conservation assessment suggest that habitat loss, cheatgrass invasion, disease, predation, herbicides, and drought could be factors in the greater sage-grouse population declines. Addressing these issues will facilitate recovery of this important species and, ultimately, associated species and habitats. Because Oregon is a stronghold for this species, conservation actions here are critical. For more information see: ODFW website; Western Association of Fish and Wildlife Agencies; USGS – SAGEMAP website (http://sagemap.wr.usgs.gov) (a web-based forum for making datasets available and to provide information for research and management).

Some areas are still recovering from intensive management in the past. For example, the Bureau of Land Management began a massive effort in 1962 to rehabilitate degraded rangelands by establishing a non-native pasture grass, crested wheatgrass, and by removing the native sagebrush. Over the course of 10 years, the Vale Rehabilitation Project seeded 250,000 acres to crested wheatgrass and used plowing, chaining, and herbicides to reduce sagebrush on as much as 506,000 acres. Currently the Bureau of Land Mangement maintains extensive wilderness areas in this ecoregion (e.g., Malheur Refuge, Hart Mountain, Steens Cooperative Management and Protection Area, Bureau of Land Mangement areas of critical environmental concern at Lake Abert, Warner Valley, Owyhee canyons).

Historic overgrazing and fire suppression, followed by invasion of weedy annual grasses such as cheatgrass, have greatly altered natural fire cycles in many sagebrush steppe habitats. Landscapes formerly comprised of mosaics dominated by bunchgrasses and forbs are now heavily and disproportionately dominated by shrubs (mostly sagebrush), and exotic grasses and forbs. Invasive species and altered fire regimes are the greatest terrestrial conservation issues in this ecoregion. As a result of altered fire regime, encroachment of juniper has displaced grasses and sagebrush, especially in the northern portions of the ecoregion. However, old-growth juniper occurs in some areas, especially in rock outcrops where grasses and sagebrush are uncommon and where fire is less of a factor, and is extremely beneficial to wildlife.

Popular with sportsmen and biologists, greater sage-grouse also are considered excellent indicators of sagebrush habitat quality. Current efforts to improve conditions for greater sage-grouse include comprehensive range-wide assessments of both species and habitat.

Stream water quality in the Northern Basin and Range ecoregion is poor when compared to other ecoregions. Throughout the Northern Basin and Range ecoregion, water quality is impacted by high temperatures and in some areas by bacteria, pollutants, and aquatic weeds. Water is limited in the ecoregion, fully allocated in storage and other uses.

Summary List of Strategy Species

Mammals

- California myotis (bat)
- Hoary bat
- Kit fox
- Long-legged myotis (bat)
- Pallid bat
- Pygmy rabbit
- Spotted bat
- Townsend's big-eared bat
- White-tailed jackrabbit

Plants

- Boggs Lake hedge-hyssop
- Cronquist's stickseed
- Crosby's buckwheat
- Davis' peppergrass
- Golden buckwheat
- Grimy ivesia
- Malheur Valley fiddleneck
- Malheur wire-lettuce
- Mulford's milk-vetch
- Oregon semaphore grass
- Owyhee clover
- Packard's mentzelia
- Smooth mentzelia
- Snake River goldenweed
- Sterile milk-vetch

Fish

- Abert Lake tui chub (Oregon Lakes tui chub)
- Alvord chub
- Borax Lake chub
- Catlow tui chub
- Foskett spring speckled dace
- Hutton tui chub
- Inland Columbia Basin Redband Trout
- Lahontan cutthroat trout
- Malheur mottled sculpin
- Oregon Basins Redband Trout (Foster Creek redband trout)
- Oregon Basins Redband Trout (Catlow Valley redband trout SMU)
- Oregon Basins Redband Trout (Warner Valley redband trout SMU)
- Sheldon tui chub
- Summer Basin tui chub
- Warner Basin tui chub
- Warner sucker

Amphibians & Reptiles

- Columbia spotted frog
- Northern leopard frog
- Western toad

Birds

- American peregrine falcon
- American white pelican
- Black-necked stilt
- Bobolink
- Ferruginous hawk
- Franklin's gull
- Greater sage-grouse
- Greater sandhill crane
- Juniper titmouse
- Long-billed curlew
- Mountain quail
- Snowy egret
- Swainson's hawk
- Western snowy plover
- Willow flycatcher

Invertebrates

- Borax Lake ramshorn
- Crooked Creek springsnail
- Harney Lake springsnail
- *Malheur Cave endemics:*
  - Malheur Cave amphipod
  - Malheur Cave flatworm
  - Malheur isopod
  - Malheur pseudoscorpian
  - Malheur Cave springtail

Aquatic habitats are affected by altered channel and flow conditions, obstructions, and poor riparian condition. Efforts to assess the quality of aquatic habitats are ongoing and obtaining an understanding of natural temperature and water quality dynamics in the ecoregion is a research priority.

Ecoregion-level limiting factors and recommended approaches

All six of the key conservation issues apply statewide, as do the approaches outlined in the Statewide Perspectives and Approaches chapter. However, invasive species and altered disturbance regimes are described further in this section, considering the Northen Basin and Range's ecoregional characteristics. In addition to the statewide issues, on-going recovery from historic overgrazing and uncontrolled off-highway vehicle use are issues in this ecoregion. Other forms of recreational use are currently compatible with conservation goals, but may become an issue in the future.

Factor: Invasive species: Invasive plants, especially those classified as noxious weeds, are of particular concern in the Northern Basin and Range ecoregion. They disrupt native communities, diminish populations of at-risk native species, and threaten the economic productivity of resource lands. Invasive plants have been on the increase during the last 20 years. The spread of cheatgrass and medusahead can increase the frequency, intensity, and spread of fires, replacing sagebrush and native bunchgrasses which are adapted to infrequent, patchy fires. While not nearly as disruptive as invasive plants, non-native animals also have impacted native fish and wildlife populations.

Approach: Emphasize prevention, risk assessment, early detection and quick control to prevent new invasives from becoming fully established. Use multiple-site appropriate tools (mechanical, chemical and biological) to control the most damaging invasive species. Prioritize efforts to focus on key invasives in high priority areas, particularly where Strategy Habitats and Species occur. Cooperate with partners through habitat programs and county weed boards address invasive species problems. Carefully manage wildfires in cheatgrass-dominated areas. Promote the use of native "local" stock for restoration and revegetation. In some cases, it may be desirable to use "assisted succession" strategies, using low seed rates of non-invasive non-native plants in conjunction with native plant seeds as an intermediate step in rehabilitating disturbances in sagebrush communities.

Factor: Altered fire regimes. Fire suppression has resulted in undesirable changes in vegetation in some habitats, contributing to the build up of woody plants that increase the intensity of fires when burned. Most big sagebrush-dominated areas were once a mosaic of successional stages, from recently burned areas dominated by grasses and forbs to old sagebrush-dominated stands that have not burned for 80 to 100 years. However, altered fire regimes has reduced this mosaic and resulted in large areas dominated by older big sagebrush with an understory of invasive annual plants.

As a result of fire suppression and other factors, western junipers encroach into and degrade sagebrush, riparian, large-diameter juniper, and aspen habitats. Dense juniper stands are not suitable for species that require open sagebrush, but old growth juniper, often found in rocky outcrops, are beneficial to wildlife.

While a useful tool, prescribed fire might not be suitable for all habitats. Some sagebrush habitats, such as low sagebrush communities, are extremely slow to recover from disturbance such as prescribed fire.

Approach: Carefully evaluate sites to determine if prescribed fire is appropriate and be particularly cautious in low productivity low sagebrush sites where recovery times are prolonged. If determined to be ecologically beneficial, reintroduce natural fire regimes using site-appropriate prescriptions (accounting for the historic fire regime, as well as area size and vegetation characteristics that affect resiliency and resistance to disturbance). Use prescribed fire to create a mosaic of successional stages and avoid large prescribed fires. Avoid fires in areas of high sensitivity and with slow recovery times. In areas where prescribed fire is undesirable or difficult to implement, use mechanical treatment methods (e.g., chipping, cutting for firewood) that minimize soil disturbance. Develop markets for small juniper trees as a special forest product to reduce restoration costs. Maintain large-diameter juniper trees, which are important nesting habitat for songbirds and raptors. Consider landscape context and landscape diversity when planning conservation actions.

Factor: On-going recovery from historic overgrazing. Prior to limitations that were initiated on public lands in the mid-1930s, livestock grazing had a profound influence on landscapes throughout the Northern Basin and Range ecoregion. Many areas experienced serious ecological damage. Conditions on rangelands in general have improved substantially over the past half-century as a result of improvements in livestock management, and most ecosystems are recovering. However, some habitats have been slow to recover (e.g., some riparian areas and sagebrush communities, especially where cheatgrass has invaded).

Invasive Non-native Species

Invasive species currently are considered to be one of the primary causes of species becoming threatened and endangered, second only to habitat conversion. Many species are as threatening to people's livelihoods as they are to fish and wildlife and their habitats. This section identifies the species with the greatest current and potential impact in the Northern Basin and Range. They were determined through an analysis of Oregon Department of Agriculture's Noxious Weed List, ODFW's Wildlife Integrity Rules, ODFW's Introduced Fish Management Strategies report, information from Portland State University Center for Lakes and Reservoirs, and local expert review. Although some of these species also cause significant economic damage to farms, ranches, and managed forests, this list is focused on those that cause the most severe ecological damage. Impacts from introduced game fish vary from species to species and within ecoregions. As a result, the impacts need to be evaluated more locally (ODFW Introduced Fish Management Strategies Report).

Known invasive non-native animal and plant species

These species are established or documented in this ecoregion, and are known to impact native fish and wildlife populations and habitats. They may range from small, controllable populations to widespread infestations.

Documented Invasive Animals

- Bluegill
- Brook trout
- Brown bullhead
- Brown trout
- Bullfrog
- Carp
- Channel catfish
- Crappie
- Eastern gray squirrel
- European starling
- Fathead minnow
- Golden shiner
- Goldfish
- House sparrow
- Hybrid bass
- Largemouth bass
- Mosquito fish (*Gambusia*)
- New Zealand mud snail
- Norway rat
- Pikeminnow
- Smallmouth bass
- Utah chub
- White and black crappie
- Wiper
- Yellow perch

Documented Invasive Plants

- Cheatgrass
- Dalmatian toadflax
- Diffuse knapweed
- Dyers woad
- Halogeton
- Hounds tongue
- Leafy spurge
- Medusahead rye
- Perennial pepperweed
- Purple loosestrife
- Reed canarygrass
- Rush skeletonweed
- Scotch thistle
- Spotted knapweed
- Squarrose knapweed
- Sulfur cinquefoil
- Tamarisk (salt cedar)
- Tansy ragwort
- Whitetop
- Yellow starthistle
- Yellow toadflax

Non-native animals and plants of potential concern

Preventing the establishment of invasive non-native species is far more cost-effective and practical than trying to eradicate them once they are established. To make the best use of financial and personnel resources, prevention efforts need to be prioritized to address the greatest threats, especially since many non-native species do not pose a significant threat to fish and wildlife populations and habitats. Potentially harmful non-native species can be identified by examining biological factors, potential impacts and invasion patterns in similar climates. The species listed here are included because: 1) they are not known to occur in this ecoregion, but could pose a threat to fish and wildlife populations and habitats if they become established; or 2) they are known to occur in this ecoregion but the extent to which they impact native species and disrupt ecological processes is unclear at this time.

Potentially Invasive Non-native Animals

- Asian carp (bighead, silver)
- Black carp
- Feral pig
- Oriental weatherfish
- Rainwater killfish
- Round goby
- Ruffe
- Rusty crayfish
- Sacramento perch
- Snakeheads
- Zebra mussel

Potentially Invasive Non-native Plants

- Barbed goatgrass
- Camelthorn
- King devil hawkweed
- Narrow-leaf cattail
- Ovate goatgrass
- Paterson's curse
- Purple starthistle
- Skeletonleaf bursage
- Syrian bean caper
- Texas blueweed
- Yellow hawkweed

Approach: Continue to proactively manage livestock grazing and restore degraded habitats. Minimize grazing during restoration of highly sensitive areas, such as wetlands and riparian areas.

Factor: Uncontrolled off-highway vehicle use. Use by off-highway vehicles (OHVs) has increased dramatically, with permits doubling statewide during 1999-2004. While limited and controlled OHV use can be compatible with wildlife conservation; unlimited and uncontrolled use can impact riparian, aquatic, and upland habitats; spread invasive plant seeds; affect wildlife behavior and distribution, especially during critical breeding and wintering periods; damage soils; and increase risk of wildfires. Although OHV use is limited to designated roads in some sensitive landscapes, there is little to no enforcement due to lack of funds and law enforcement personnel.

Approach: Work cooperatively with land managers and OHV groups to direct use to maintained trails in low-impact areas and improve enforcement of existing rules. Support educational efforts to promote low-impact recreational use, such as the "Tread Lightly!" program. Monitor OHV impacts at priority areas. Support efforts to effectively manage OHV use on public lands, particularly in highly sensitive habitats, and restore damaged areas.

Factor: Other unmanaged recreational use. In addition to OHV use, other recreational use such as camping, rock climbing and parasailing is increasing and contributing to some associated development. Although recreational use is still light in comparison to other ecoregions, new uses such as parasailing could impact wildlife behavior and populations by making previously remote areas more accessible to people.

Approach: Proactively consider potential impacts to wildlife and habitats when developing or promoting recreational opportunities to encourage compatible uses. Monitor recreational patterns and trends.

Factor: Water distribution in arid areas and wildlife entrapment in water developments. In arid areas, water availability can limit animal distribution. Water developments established for cattle, deer, and elk can significantly benefit birds, bats, and small mammals as well. However, some types of these facilities, particularly water developments for livestock, can have unintentional hazards. These hazards include over-hanging wires that act as trip lines for bats, steep side walls that act as entrapments under low water conditions, or unstable perches that cause animals to fall into the water. If an escape ramp is not provided, small animals cannot escape and will drown.

Approach: Continue current efforts to provide water for wildlife in arid areas. Continue current design of big game "guzzlers" that accommodate a variety species and retrofit older models where appropriate to make them compatible with newer design standards. Use and maintain escape devices on water developments where animals can become trapped. Remove obstacles that could be hazardous to wildlife from existing developments.

Conservation Success Story: Local ranching cooperative promotes stewardship on the range

A cooperative of 90 family ranches operating under the label 'Country Natural Beef' (CNB, formally Oregon Country Beef) is revolutionizing the ranching business. Founded in the mid 1980s by a handful of Oregon ranchers, Country Natural Beef personifies a business philosophy based on the principles of economic, social and environmental sustainability. Together, member ranches graze cattle on four million acres of privately owned or publicly managed pastures, meadows and open range land. The cooperative recognizes that their rural ranching lifestyle, consumer trust and resource conservation are all interconnected and that one cannot exist without the other.

CNB member ranches adhere to a form of holistic, sustainable range management that minimizes their environmental 'footprint.' This stewardship ethic is reflected in a set of low-impact grazing practices and a belief that a biologically healthy rangeland is more resilient and productive. Ranchers strive to limit the duration and intensity of cattle grazing in an effort to give native grasses a rest and the time they need to recover before grazing resumes. CNB encourages a diversity of native wildlife such as rodents, insects, birds and predators on the range and prides itself on adapting "our individual environments rather than fitting the environment to our management."

Located to the east of majestic Steens Mountain in the Catlow Valley is Roaring Springs Ranch, which has been a member of Natural Country Beef for more than 10 years. The 250,000-acres ranch fulfills the cooperative's stewardship ethic by frequently rotating cattle to keep grazing pressure to a minimum on the sagebrush-dominated high desert ecosystem. Ranch manager Stacy Davies says "our aim is to graze an area on the range one day a year and then we rest that area for the remainder of the year." Stacy manages cattle on land owned by the ranch and has leasing rights to another 250,000 acres managed by the Bureau of Land Management.

Roaring Springs Ranch also has been actively involved in voluntary conservation activities aimed at improving habitat for at-risk fish and wildlife. In 1997, the ranch entered voluntarily into a Candidate Conser-

Conservation actions in the North Basin and Range Ecoregion identified through other planning efforts

Landowners and land managers can benefit a variety of fish and wildlife species by managing and restoring Strategy Habitats. The following recommendations are relevant to Strategy Habitats. They were identified through a review of existing plans.

Actions	Strategy Habitat and General Location	Source Document
Initiate actions to maintain aspen habitats in conservation status at the following locations: 750 acres Hart Mountain; 20,000 acres – Steens/Alvord; 300 acres – Trout Creek Mountains; 400 acres Bully Creek	Aspen habitat in Northern Basin and Range ecoregion	Eastside All-Bird Implementation Plan (Ivey 2000) [recommended target: 21,750 acres in conservation status]
Initiate actions to maintain sagebrush-steppe habitats in conservation status at the following locations: 25,000 acres – Warner Basin; 400,000 acres – Hart Mountain; 650,000 acres – Steens/Alvord; 230,000 acres – Trout Creek Mountains; 480,000 acres – West Little Owyhee; 200,000 Bully Creek	Sagebrush habitat in Northern Basin and Range ecoregion	Eastside All-Bird Implementation Plan (Ivey 2000) [recommended target: 1,985,000 acres in conservation status]
Initiate actions to maintain alkaline wetland habitats in conservation status at the following locations: 35,000 acres – Lake Abert; 10,000 acres – Hart Mountain; 10,000 acres – Steens/Alvord; 20,000 acres – Harney Basin; 20,000 acres – Summer Lake	Alkaline wetland habitat in Northern Basin and Range ecoregion	Eastside All-Bird Implementation Plan (Ivey 2000) [recommended target: 95,000 acres in conservation status]
Initiate actions to maintain emergent wetland habitats in conservation status at the following locations: 500 acres – Warner Basin; 5,000 acres – Cheuwacan Marsh; 15,000 acres – Hart Mountain; 10,000 acres – Steens/Alvord; 40,000 acres – Harney Basin; 7,000 acres – Summer Lake; 3,000 acres Paulina Marsh	Wetland habitat in Northern Basin and Range ecoregion	Eastside All-Bird Implementation Plan (Ivey 2000) [recommended target: 80,500 acres in conservation status]
Initiate actions to maintain wet meadow habitats in conservation status at the following locations: 3,000 acres – Warner Basin; 10,000 acres – Cheuwacan Marsh; 1,000 Lake Abert; 20,000 acres – Hart Mountain; 20,000 acres – Steens/Alvord; 50,000 acres – Harney Basin; 10,000 acres Silvies/Bear Valley; 20,000 acres Malheur Headquarters; 5,000 acres – Summer Lake; 5,000 acres Paulina Marsh	Wet meadow habitat in Northern Basin and Range ecoregion	Eastside All-Bird Implementation Plan (Ivey 2000) [recommended target: 144,000 acres in conservation status]
Initiate actions to maintain riparian shrub habitats in conservation status at the following locations: 1,000 acres – Warner Basin; 500 acres – Hart Mountain; 1,000 acres – Steens/Alvord; 100 acres Trout Creek Mountains; 2,000 acres – Harney Basin; 300 acres - Aldrich Mountains; 200 acres - Malheur Headquarters	Riparian shrub habitat in Northern Basin and Range ecoregion	Eastside All-Bird Implementation Plan (Ivey 2000) [recommended target: 5,100 acres in conservation status]
Initiate actions (e.g., restoration, protection) at the landscape level to maintain more than 30% of the historical extent of each riparian system to conditions that support healthy (i.e., source) populations of priority species	Riparian habitat in Northern Basin and Range ecoregion	Partners in Flight Columbia Plateau Conservation Strategy (Altman and Holmes 2000)
Initiate actions (e.g., restoration, protection) in large areas of sagebrush habitat to maintain more than 50% of the landscape in mid-late seral stage with canopy cover more than 15% and at least one contiguous tract more than 1,000 acres	Sagebrush habitat in Northern Basin and Range ecoregion	Partners in Flight Columbia Plateau Conservation Strategy (Altman and Holmes 2000)
Restore drainage. Improve water management facilities. Use fishways, traps, and screens to limit carp migration to enhance productivity of wetlands and other aquatic habitats	Malheur Lake, Harney Basin	Joint Venture Implementation Plans for Eastern Oregon - Oregon Closed Basin (Ivey 2000)
Consider the impact of recreational activities (e.g., motorized watercraft; road usage) on water quality and watershed function	Aquatic habitat in Northern Basin and Range ecoregion	State of the Environment Report; Oregon Plan (OWEB); Total Maximum Daily Load Planning (ODEQ)
Focus conservation attention on critical aquatic habitats identified in American Fisheries Society survey work	Trout Creek Mountains area	Oregon Biodiversity Project. See: NOAA and NMFS biologists; ODFW; watershed councils; OWEB for further information.
Improve fish passage. For example, modify barriers or use spans where appropriate.	Stream habitat in Northern Basin and Range ecoregion	NWPCC Subbasin plans 2004 (Owyhee, Malheur); State of the Environment Report; ODFW Fish Passage team; Oregon Biodiversity Project; Oregon Plan (OWEB)

Actions	Strategy Habitat and General Location	Source Document
Work with forest managers to meet large wood loading benchmarks, reduce sediment, maintain water quality and continue to provide functional riparian habitat	Riparian habitat in Northern Basin and Range ecoregion	NWPCC Subbasin plans 2004 (Owyhee, Malheur); Oregon Plan (OWEB); Senate Bill 1010 Plans (ODA); Total Maximum Daily Load Planning (ODEQ)
Work with agricultural landowners to maintain water quality	All locations on agricultural lands (as appropriate) in Northern Basin and Range ecoregion	Senate Bill 1010 Plans (ODA) and Total Maximum Daily Load Planning (ODEQ)
Establish integrated framework for wetland restoration assessment, priority setting, and actions at three scales: watersheds, ecoregions and project sites	Wetlands	Recommendations for a nonregulatory wetland restoration program for Oregon. J.W. Good and C.B. Sawyer. 1998. Prepared for Oregon Division of State Lands and U.S. EPA Region X.
Increase incentives for proactive, nonregulatory wetland restoration and enhancement on private land, focusing on a combination of financial assistance, tax benefits, technical assistance, and education	Wetlands	Recommendations for a nonregulatory wetland restoration program for Oregon. J.W. Good and C.B. Sawyer. 1998. Prepared for Oregon Division of State Lands and U.S. EPA Region X.
Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology. - Plant vegetation to stabilize banks; leaving stumps, fallen trees and boulders in waterways - Maintain or enhance off channel or side channel meanders, habitat and pools	Aquatic habitats (streams, pools)	Oregon Aquatic habitat restoration and enhancement guide. The Oregon Plan for Salmon and Watersheds May 1999. *See guide for specific technical recommendations, sources of information and assistance, and other guidelines.*
Maintain riparian and wetlands function: - Manage grazing, riparian vegetation planting and fencing, and livestock water facilities according to best practices, current techniques and with respect to natural hydrological conditions.	Riparian and wetlands habitats	Oregon Aquatic habitat restoration and enhancement guide. The Oregon Plan for Salmon and Watersheds May 1999. *See guide for specific technical recommendations*
Upslope erosion control: - Create water and sediment control basins to contain runoff, wastewater - Use windbreaks (tree and shrub rows– using native plants) to reduce erosion and deposition - Upland terracing	Aquatics, riparian and wetland habitats	Oregon Aquatic habitat restoration and enhancement guide. The Oregon Plan for Salmon and Watersheds May 1999. *See guide for specific technical recommendations*

**Note: Conservation Strategy monitoring indicators, linked with OSOER Key indicators, targets, and methods, will be identified in a statewide approach (See Monitoring chapter for more information).*

vation Agreement with three government agencies to repair freshwater habitat for redband trout, a candidate for federal protection at the time. Under this agreement, the ranch modified its grazing practices in riparian areas, restored streamside vegetation and screened off irrigation canals to prevent fish from entering. These efforts, as well as those taken by other ranches in the area that signed similar agreements, led the government to decide that federal protection for redband trout was not necessary.

Country Natural Beef is growing a successful, sustainable business that is balancing the needs of rangeland ecosystems with those of ranching families that depend on the resource base for a living.

Conservation Success Story: Fast food chain supports rangeland conservation

Fish and wildlife have an ally in Oregon-based Burgerville. In 2004, the Northwest fast food restaurant chain made a corporate decision to buy beef produced in a way that is more sensitive to rangeland habitat and species. This decision reinforces Burgerville's commitment to sustainable business practices and to using the highest quality ingredients from Northwest producers.

Founded in Oregon, Country Natural Beef (also known as Oregon Country Beef) supplies Burgerville with more than 1.75 million pounds of naturally raised beef each year. Central to the philosophy of Country Natural Beef is the belief that rangeland stewardship is in the best, long-term interest of the resource base and the families whose livelihoods depend on it. Member ranches are certified by a third-party organization for following best grazing practices, which reduce the intensity and duration of cattle grazing on native grasses and shrubs like sagebrush. Country Natural Beef cattle also are raised without the use of growth hormones, antibiotics or animal-based feed – attributes that strongly appeal to health-conscious consumers.

Burgerville's customers have responded enthusiastically to the fast food burger chain's transition to Country Natural Beef. In the first two months following Burgerville's announcement in February 2004, sales increased 11 percent. For the rest of 2004 the trend continued with sales increases hovering about eight percent.

As Tara Wafers, Burgerville's Vice President for Marketing, says "Our sales data strongly suggest that our decision to carry exclusively Oregon Country Beef patties resonates with customers." She adds, "customers take comfort in the fact that their purchase helps local ranchers, Oregon's environment and is the best their money can buy."

Deciding Where to Work

Conservation Opportunity Areas Map and Profiles

Landowners and land managers throughout Oregon can contribute to conserving fish and wildlife by maintaining, restoring, and improving habitats. Conservation actions to benefit Strategy Species and Habitats are important regardless of location. However, focusing investments in certain priority areas can increase likelihood of long-term success over larger landscapes, improve funding efficiency, and promote cooperative efforts across ownership boundaries. Conservation Opportunity Areas are landscapes where broad fish and wildlife conservation goals would be best met. Conservation Opportunity Areas were developed to guide voluntary, non-regulatory actions. This map and the associated data should only be used in ways consistent with these intentions. For more information on how Conservation Opportunity Areas were developed, see Appendix IV, "Methods" (beginning on page a:34).

The Conservation Opportunity Area profiles include information on recommended conservation actions, special features, key species, key habitats, and if the area has been identified as a priority by other planning efforts. These profiles highlight some priority actions to implement in individual Conservation Opportunity Areas, which can range from restoration projects to monitoring for invasive species. These recommendations were identified through existing plans, spatial analysis, and expert review. They are not meant to be exhaustive, so other actions also will be appropriate, as influenced by local site characteristics and management goals. Actions need to be compatible with local priorities, local comprehensive plans and land use ordinances, as well as other local, state, or federal laws. Actions on federal lands must undergo federal planning processes prior to implementation to ensure consistency with existing plans and management objectives for the area.

Lakeview Biomass Project

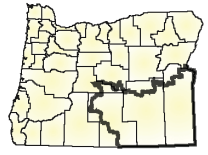
Approximately 84 percent of Oregon's forestlands currently are either moderately or highly departed from their historic fire regimes (Fire Condition Class II or III; see altered fire regime discussion in the Statewide Perspectives and Approaches chapter beginning on page 47). As a result, these forests are at risk of severe drought stress, insect and disease outbreaks, and uncharacteristically severe wildfires due to dense vegetation (including large volumes of biomass) and continuous fuels from the forest floor to the forest canopy. Addressing these issues will require removal of excess biomass in small to medium size trees, retention of large trees, and return of natural forest processes. Significant fish and wildlife benefits would come from restoring habitats, forest resilience, and water flows.

However, restoring wildlife habitats and ecological function presents technical, ecological, and economic challenges. Lake County exemplifies these challenges. The local forest sector industry, that could be mobilized to address the forest biomass issue, is dwindling. Additionally, the absence of economically viable utilization options for small diameter trees makes their removal prohibitively costly.

Innovative approaches are needed. An integrated solution will require a different forest management model that entails creation and application of new governance models, new forest management techniques and tools, new processes for utilizing forest products, and new methods to contain costs and account for the full array of benefits derived from forest restoration. A proposed biomass energy facility in Lakeview potentially could contribute to such an integrated approach by reducing costs of habitat restoration activities and reducing wildfire risks, while increasing job opportunities. An efficient biomass energy facility would add a means for processing biomass and for making wood products from small-diameter trees.

Project success will depend on overcoming several economic and policy challenges through the collaborative efforts of a diverse group of stakeholders. To facilitate this collaboration, Governor Theodore Kulongoski designated the Lakeview Biomass Project an Oregon Solutions project in January 2005, assuring participation of his staff and appropriate state agencies in a Community Governance process. Through a series of multi-stakeholder meetings, issues, challenges, and opportunities will be fully explored by local governments, state and federal agencies, businesses, non-profits and other interested parties. As an important first step in this project, partners will create a Declaration of Cooperation that will include implementation plans, guideposts, and benchmarks for success.

For more information, visit www.orsolutions.org/central/lakeviewbiomass.htm.



Northern Basin and Range Ecoregion Conservation Opportunity Areas

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data information sources to ascertain the usability of the information.

Conservation Opportunity Area Profiles

NBR-01. Squaw Ridge area playas and sagebrush

This area is located along the western part of the ecoregion, following the high lava plains subregion from the Squaw Ridge Wilderness Study Area to just southeast of the Lost Forest Area of Critical Environmental Concern.

Special Features:

- *This area includes a large percentage of the ecoregion's playas, or ephemeral wetlands, which may provide important habitat for wildlife. The role of playas in ecosystem function is a data gap.*
- *Area includes important areas for sage grouse.*

Key Habitats:

- Big Sagebrush Shrublands
- Wetlands

Key Species:

- Ferruginous Hawk
- Sage Grouse
- Swainson's Hawk
- Pygmy Rabbit

Recommended Conservation Actions:

- Control spread of western juniper to maintain habitat values in sagebrush habitats
- Manage livestock grazing to promote recovery and maintenance of vernal pool (playa) wetlands
- Restore and maintain complex, continuous sage habitat

NBR-02. Summer Lake area

This area is comprised of Summer Lake and the surrounding high desert wetlands subregion, including much of the Diablo Mountain Wilderness Study Area.

Special Features:

- *Area includes the Summer Lake Wildlife Area, which encompasses more than 18,000 acres dominated by diverse freshwater and alkaline wetlands.*
- *Summer Lake provides some of the most important migratory habitat for birds along the Pacific Flyway. Total use by migratory waterfowl has exceeded 5 million use-days for ducks and 4 million use-days for white geese. Shorebird uses is estimated at 1 million use-days.*
- *Summer Lake supports high diversity of nesting waterbird and significant numbers of nesting waterfowl.*
- *Diablo Mountain Wildlife Study Area includes large blocks of salt desert scrub habitats.*

Key Habitats:

- Aquatic
- Salt Desert Scrub
- Wetlands

Key Species:

- Black-necked Stilt
- Long-billed Curlew
- Snowy Egret
- Western Snowy Plover
- Summer Basin Tui Chub

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant endemism area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- Oregon's Important Bird Areas
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Improve water delivery system at Summer Lake Wildlife Area to improve effectiveness of wetland management
- Maintain diverse wetland habitats

NBR-03. Lake Abert-Honey Creek area

This area encompasses Lake Abert and most of the Honey Creek drainage, including the Lake Abert Area of Critical Environmental Concern and the Abert Rim Wilderness Study Area.

Special Features:

- *Lake Abert is largest saline lake in Pacific Northwest and one of most important shorebird habitats in the Intermountain West. Bureau of Land Management has designated 50,000-acre area of critical environmental concern.*
- *Total waterbird use is estimated at more than 3.25 million bird use-days.*
- *Abert Rim supports significant numbers of nesting raptors.*
- *Honey Creek area has high diversity of high-quality habitats*

Key Habitats:

- Aquatic
- Aspen Woodland
- Big Sagebrush Shrublands
- Riparian
- Wetlands

Key Species:

- Black-necked Stilt
- Juniper Titmouse
- Western Snowy Plover
- Oregon Great Basin Redband Trout
- Oregon Lakes Tui Chub
- Warner Sucker

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- Oregon's Important Bird Areas
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Manage livestock grazing to promote recovery and maintenance of wet meadow, riparian, and aspen habitats
- Promote early detection and suppression of invasive weeds
- Restore and maintain complex, continuous sage habitat

NBR-04. Warner Basin

Adjacent to the Hart Mountain Refuge, this area includes the High Desert Wetlands from the Warner Wetlands south to the California border.

Special Features:

- *Area includes 90,000 acres of shallow lakes, marshes, and playa wetlands.*
- *The wetland complex here provides some of the most important habitat in the region for migratory birds.*
- *Bureau of Land Management designation provides special management for 51,000-acre Warner Wetlands Area of Critical Environmental Concern.*
- *This area provides habitat for large breeding populations of colonial nesting waterbirds and several species of endemic fish.*

Key Habitats:

- Aquatic
- Riparian
- Wetlands

Key Species:

- American White Pelican
- Black-necked Stilt
- Snowy Egret
- Western Snowy Plover
- Foskett Spring Speckled Dace
- Warner Sucker
- Warner Valley Redband Trout

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity and plant endemism area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- Oregon's Important Bird Areas
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Improve water management system to enhance wetlands at Warner Wetlands
- Initiate or continue wet meadow conservation and restoration efforts
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Manage livestock grazing to promote recovery and maintenance of wetland and riparian habitats
- Promote early detection and suppression of invasive weeds
- Protect springs as breeding sites for Warner sucker

NBR-05. Hart Mountain area

This area encompasses the Hart Mountain National Wildlife Refuge. It extends north to include the Orejana Canyon Wilderness Study Area and south just past the Guano Creek Wilderness Study Area.

Special Features:

- *Hart Mountain Refuge provides summer range habitat for a herd of migratory pronghorn, which winters in Nevada's adjacent Sheldon National Wildlife Refuge.*
- *There are many ongoing wildlife studies conducted on the refuge including those on pygmy rabbits, sagegrouse, bighorn sheep, coyote predation, and riparian conditions.*
- *The 278,000-acre refuge is one of the most expansive wildlife habitats in the arid West free of domestic livestock. [Hart Mtn Refuge website]*

- *Seasonal wetlands provide important habitat for migrating waterfowl.*

Key Habitats:

- Aquatic
- Aspen Woodland
- Big Sagebrush Shrublands
- Riparian
- Wetlands

Key Species:

- Ferruginous Hawk
- Sage Grouse
- Swainson's Hawk
- Catlow Tui Chub
- Catlow Valley Redband Trout
- Sheldon Tui Chub
- Pronghorn Antelope
- Pygmy Rabbit

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity and plant endemism area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- Oregon's Important Bird Areas
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Initiate or continue wet meadow conservation and restoration efforts
- Maintain alkaline wetland habitats
- Maintain and restore aspen habitats
- Maintain and restore sagebrush-steppe habitats
- Promote early detection and suppression of invasive weeds
- Restore and maintain complex, continuous sage habitat

NBR-06. Basque Hills-Hawk Mountain area plains

This area encompasses most of Basque Hills and Rincon Wilderness Study Areas, and parts of two others (Spalding, Hawk Mountain), focusing on the greatest concentrations of sagebrush habitat.

Special Features:

- *Area contains extensive, high-quality sagebrush habitats.*

Key Habitats:

- Aspen Woodland
- Big Sagebrush Shrublands
- Wetlands

Key Species:

- Ferruginous Hawk
- Sage Grouse
- Swainson's Hawk
- Pygmy Rabbit

Recommended Conservation Actions:

- Control invasive weeds in unique high-quality grasslands
- Initiate or continue wet meadow conservation and restoration efforts
- Restore and maintain complex, continuous sage habitat

NBR-07. Silvies River Floodplain

Special Features:

- *Seasonal wetlands maintained by flood irrigation and managed for hay production and livestock grazing provide high quality habitats for migrating waterfowl and other waterbirds, especially in spring.*
- *Floodplain habitats support significant numbers of nesting sandhill cranes and other waterbirds.*
- *Floodplain wetland restoration work undertaken by Ducks Unlimited, Harney Soil and Water Conservation District, Natural Resources Conservation Service, and other partners is restoring more than 2,000 acres of wetland and floodplain habitats along lower Silvies River.*

Key Habitats:

- Aquatic
- Riparian
- Wetlands

Key Species:

- Black-necked Stilt
- Franklin's Gull
- Sandhill Crane
- Oregon Great Basin Redband Trout

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan

Recommended Conservation Actions:

- Initiate or continue wet meadow conservation and restoration efforts
- Maintain or enhance in-channel watershed function, connection

to riparian habitat, flow and hydrology
- Maintain traditional agricultural practices that enhance habitat for migratory birds
- Manage fish passage to control carp
- Manage livestock grazing to promote recovery and maintenance of wetland and riparian habitats
- Promote delayed haying to protect nesting birds
- Restore floodplain wetlands

NBR-08. Harney-Malheur area

This area includes Harney Lake and Malheur Lake, extending south to include the Donner and Blitzen River floodplain, and west to Silver Lake.

Special Features:

- *Area encompasses the Malheur National Wildlife Refuge.*
- *Includes some of most important wetland habitats in the west.*
- *Area receives heavy use by migrating waterfowl and other waterbirds.*
- *Area has a high diversity of breeding waterbirds, including the largest population of nesting sandhill cranes in Oregon.*
- *There is potential for significant increase in nesting waterfowl with effective carp control.*

Key Habitats:

- Riparian
- Wetlands

Key Species:

- American White Pelican
- Black-necked Stilt
- Ferruginous Hawk
- Franklin's Gull
- Sandhill Crane
- Snowy Egret
- Swainson's Hawk
- Western Snowy Plover

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant endemism area)
- Oregon Biodiversity Project Conservation Opportunity Areas (Steens Mountain)
- Oregon's Important Bird Areas
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Control invasive carp and restore natural flows and channels in Blitzen River
- Maintain alkaline wetland habitats
- Manage wetlands to control, and where possible, eliminate carp
- Promote early detection and suppression of invasive weeds
- Restore drainage and manage water flows to maintain or enhance wetland habitats. Use fishways, traps, and screens to limit carp migration to enhance productivity of wetlands and other aquatic habitats
- Work with private lands to conserve wetlands and waterfowl/shorebird habitat

NBR-09. Steens Mountain-Alvord Basin

This area is divided into several parts including the Alvord Lake Basin, the Steens Mountain Uplands, the Pueblo Mountains, and the Steens Mountain High Lava Plains.

Special Features:

- *The unique habitat in this area is widely recognized as having significant biological value for plants and animals, resulting in many rare and endemic species.*
- *This area has exceptional diversity of high-quality habitats with high value for a wide variety of wildlife.*
- *Most of area receives some degree of protection under the Steens Mountain Cooperative Management and Protection Act.*
- *Area contains approximately 70% of the ecoregion's aspen and mountain mahogany woodlands*
- *This is an important area for migratory birds.*

Key Habitats:

- Aquatic
- Aspen Woodland
- Big Sagebrush Shrublands
- Riparian
- Wetlands

Key Species:

- Long-billed Curlew
- Sandhill Crane
- Alvord Cutthroat Trout
- Borax Lake Chub
- Catlow Tui Chub
- Catlow Valley Redband Trout
- Lahonton Cutthroat Trout
- Malheur Mottled Sculpin
- Sage-associated Species

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Interior Columbia Basin Ecosystem Management Project (plant biodiversity and plant endemism area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- Oregon's Important Bird Areas (Steens Mountain)
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Control spread of western juniper to maintain habitat values in sagebrush, aspen, and riparian habitats
- Initiate or continue wet meadow conservation and restoration efforts
- Maintain alkaline wetland habitats
- Manage livestock grazing to promote recovery and maintenance of riparian habitats
- Promote early detection and suppression of invasive weeds
- Restore and maintain complex, continuous sage habitat
- Restore aspen woodlands and forests

NBR-10. Malheur River area

Key Habitats:

- Aquatic
- Big Sagebrush Shrublands
- Riparian

Key Species:

- Sage Grouse
- Willow Flycatcher
- Bull Trout (Columbia River Population)
- Inland Columbia Basin Redband Trout

Identified in other planning efforts:

- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)

Recommended Conservation Actions:

- Maintain or enhance in-channel watershed function, connection to riparian habitat, flow and hydrology
- Maintain or restore riparian habitat and ecological function; ensure sufficient habitat complexity for wildlife
- Manage sagebrush habitats to achieve and maintain habitat goals of Oregon Sage Grouse Strategy
- Restore drainage and manage water flows to maintain or enhance wetland habitats. Use fishways, traps, and screens to limit carp migration to enhance productivity of wetlands and other aquatic habitats
- Restore ponderosa pine and aspen in riparian zone and in surrounding uplands

NBR-11. Trout Creek Mountains

Special Features:

- *Aspen and mountain mahogany woodlands provide important breeding habitat for many rare songbirds in Oregon including probable or confirmed nesting of the Gray-headed Junco and Virginia's warbler. [Important Bird Areas website]*
- *Area includes several Wildlife Study Areas and an Area of Critical Environmental Concern.*
- *Trout Creek and Oregon Canyon Mountains contain several rare fish species.*

Key Habitats:

- Aquatic
- Aspen Woodland
- Big Sagebrush Shrublands
- Riparian

Key Species:

- Gray-headed Junco
- Sage Grouse
- Songbirds
- Virginia's Warbler
- Lahonton Cutthroat Trout

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas
- Oregon's Important Bird Areas

Recommended Conservation Actions:

- Manage livestock grazing to promote recovery and maintenance of wet meadow and riparian habitats
- Restore and maintain complex, continuous sage habitat
- Restore riparian zones and protect rare fish habitats

NBR-12. Saddle Butte

Located along the Owyhee River, this area encompasses most of the Saddle Butte Wilderness Study Area, including the Saddle Butte Area of Critical Environmental Concern (ACEC).

Key Habitats:

- Big Sagebrush Shrublands

Key Species:

- Ferruginous Hawk
- Sage Grouse
- Swainson's Hawk
- Pygmy Rabbit

Identified in other planning efforts:

- Oregon Biodiversity Project Conservation Opportunity Areas (Middle Owyhee River)
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Restore and maintain complex, continuous sage habitat

NBR-13. Middle Owyhee River Area

Special Features:

- *High quality mountain-mahogany-sagebrush communities in the Mahogany Ridge ACEC provide important habitat for many landbird species.*
- *Canyon areas provide habitat for a number of rare endemic plant species.*
- *Unique volcanic ashbeds provide habitat for endemic plants.*

Key Habitats:

- Aspen Woodland
- Big Sagebrush Shrublands
- Riparian

Key Species:

- Columbia Spotted Frog
- Ferruginous Hawk
- Sage Grouse
- Swainson's Hawk

Identified in other planning efforts:

- Interior Columbia Basin Ecosystem Management Project (plant biodiversity area)
- Oregon Biodiversity Project Conservation Opportunity Areas
- The Nature Conservancy Ecoregional Assessment (Succor Creek)

Recommended Conservation Actions:

- Restore and maintain complex, continuous sage habitat

NBR-14. Upper Owyhee

Located in the southeast corner of the state, this area encompasses several Wilderness Study Areas including Owyhee Canyon, Lookout Butte, and Upper West Little Owyhee.

Special Features:

- *Encompasses one of the largest remaining blocks of high quality sagebrush habitat in the west.*
- *Toppin Creek Butte ACEC / RNA (3,996 acres) was established here in 2002 by the BLM to protect high-quality sagebrush steppe communities and habitat for sage grouse and other landbirds. [Oregon Biodiversity Project website]*
- *The BLM recently (2003) adopted a new management strategy for the Louse Canyon wildlife area which emphasizes sagebrush-associated wildlife and at-risk species. [Oregon Biodiversity Project website]*

Key Habitats:

- Big Sagebrush Shrublands
- Riverine Canyons

Key Species:

- Ferruginous Hawk
- Sage Grouse
- Swainson's Hawk
- Pygmy Rabbit

Identified in other planning efforts:

- Eastern Oregon Bird Conservation Plan
- Oregon Biodiversity Project Conservation Opportunity Areas
- Sage Grouse Plan
- The Nature Conservancy Ecoregional Assessment

Recommended Conservation Actions:

- Protect playas in SE corner of the state for newly discovered fairy shrimp population and other rare species/habitats
- Protect riverine canyons and riparian zones within them
- Restore and maintain complex, continuous sage habitat