

ATTACHMENT E

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Herbaceous Wetlands

Hab Code: HWET

Special Status Habitat(s) within this type: All

General Characteristics

Wetlands are covered with water during all or part of the year. Permanently wet habitats include backwater sloughs, oxbow lakes, and marshes, while seasonally wet habitats include seasonal ponds, vernal pools and wet prairies. Wetland habitats are highly diverse and include the following:

Deciduous swamps and shrublands are located in depressions, around lakes or ponds or on river terraces. They generally flood seasonally with nutrient-rich waters and are dominated by woody vegetation including willows, spirea, alder, red-osier dogwood, Pacific crabapple, and ash. These scrub-shrub and wooded wetlands are often associated / classified with wooded riparian areas and better fit there, but have been included with wetlands for more complete coverage.

Marshes (including emergent marshes) occur in depressions (ponds), fringes around lakes and along slow-flowing streams especially in valley bottoms. Marshes are seasonally or continually flooded and have water-adapted plants such as sedges, bulrush, spikesedges, rushes, cattails, and floating vegetation. Marshes can have mucky soils resulting in water with high mineral content and dominated by herbaceous species, often including wildflowers.

Off-channel habitat (oxbow lakes, stable backwater sloughs, and flooded marshes) are created as rivers change course. In these areas, water moves slowly, providing quiet aquatic habitats.

Seasonal ponds and vernal pools hold water during the winter and spring but typically dry up during the dry summer months. Vernal pools occur in complexes of networked depressions that are seasonally filled with rainwater. They host a variety of species with unique adaptations.

Wet prairies occur in lowlands, especially in floodplains whereas wet meadows occur in depressions surrounded by forests and are associated with snow melt. Wet prairies are dominated by grasses, sedges and wildflowers.

Habitat Status and Threats

Wetlands provide important habitat for migrating and breeding waterfowl, shorebirds, waterbirds, songbirds, mammals, amphibians and reptiles. In addition to being critical for birds and many kinds of wildlife, floodplain wetlands and backwater sloughs and swamps are important rearing habitats for juvenile salmon. Wetlands have direct value for people because they improve water quality by trapping sediments and toxins, recharge aquifers, store water, and reduce the severity of floods. Restoration and careful management of wet meadow systems and other wetlands can increase sustainable production of forage for livestock and increase late-season stream flows.

In general, most wetland habitat loss has occurred at lower elevations and valley bottoms. Many of these wetlands have been drained and converted to agriculture. Almost all remaining wetlands in the Willamette Valley have been degraded to some degree by altered water regimes, pollution, and invasive plants and animals.

Habitat Types, Status, Threats, and Limiting Factors

Limiting Factors

Biological Stressors

Climate Change

Disruption of Natural Disturbance Regimes Habitat Types, Status, Threats, and Limiting Factors

Habitat Fragmentation and Access

Human Disturbance

Physical Habitat Change

Pollution

Vegetation Change and Altered Habitat Structure

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Open Water – Lakes, Rivers, and Streams **Hab Code:** WATR

Special Status Habitat(s) within this type:

General Characteristics

Freshwater aquatic habitats include rivers, streams, ponds, lakes and reservoirs, and are defined as occurring above the influence of tides and salinity fluctuations. Freshwater aquatic habitats typically contain water year-round, while wetlands may dry out through the season. Oregon's freshwater aquatic habitats are both interconnected and highly diverse, including tributary streams and lakes at high elevations, major rivers, smaller meandering streams, springs, seeps, and many lakes and reservoirs.

Habitat Status and Threats

Water is crucial for all fish and wildlife, and high quality freshwater aquatic systems provide essential habitat to many at-risk species, including important spawning and rearing habitat for salmonids, breeding habitat for amphibians, and habitat for freshwater mussels and other invertebrates.

Limiting Factors

Biological Stressors

Climate Change

Disruption of Natural Disturbance Regimes

Habitat Fragmentation and Access

Human Disturbance

Physical Habitat Change

Pollution

Vegetation Change and Altered Habitat Structure

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Urban and Mixed Environs

Hab Code: URBN

Special Status Habitat(s) within this type: Key structures used by sensitive species

General Characteristics

Urban development occurs within or adjacent to nearly every habitat type in Oregon, and often replaces habitats that are valuable for wildlife. The highest urban densities normally occur in lower elevations along natural or human-made transportation corridors, such as rivers, railroad lines, coastlines, or interstate highways. These areas often contain good soils with little or no slope and lush vegetation. Once level areas become crowded, growth continues along rivers or shores of lakes and eventually up elevated sites with steep slopes or rocky outcrops. Typically, 3 zones are characteristic of urban habitat: high-density zone, medium-density zone and low-density zone.

The high-density zone is the downtown area of the inner city. It also encompasses the heavy industrial and large commercial interests of the city in addition to high-density housing areas such as apartment buildings and high-rise condominiums. This zone has 60% of its total surface area covered by impervious surfaces. This zone has the smallest lot size, the tallest buildings, the least amount of total tree canopy, the lowest tree density, the highest percentage of exotics, the poorest understory and subcanopy, and the poorest vegetative structure. Most streams and natural areas have disappeared from this zone. Ecoroofs, vertical landscaping and street trees may provide the best opportunity for greening these areas of the city.

The medium-density zone is comprised of light industry mixed with high-density residential areas. Housing density of 3-6 single-family homes per acre is typical. This zone has more potential wildlife habitat. With 3059% impervious soil cover, this zone has 41-70% of the ground available for plants. Isolated wetlands, stream corridors, open spaces and green belts are more frequently retained in this zone than in the high-density zone. However, remnant wetland and riparian areas are often widely separated by urban development. Restoring structural complexity in simplified parks, naturescaping private properties, planting street trees and reconnecting natural areas are potentially important strategies to pursue in this zone.

The low-density zone is the outer zone of the urban-rural continuum. This zone contains only 10-29% impervious ground cover and normally contains only single-family homes. It has more natural ground cover than artificial surfaces. Vegetation is denser and more abundant than in the previous two zones. Typically, housing densities are 0.4-1.6 single-family homes per acre, and road density is the lowest of all 3 zones, consisting primarily of secondary and tertiary roads. Many wetlands remain and are less impacted. Water levels are more stable and peak flows are more typical of historic flows. Watertables are less impacted and vernal wetlands are more frequent; stream corridors are less impacted and more continuous.

Habitat Status and Threats

Within urban areas, a diversity and mosaic of remnant natural habitat fragments, albeit often simplified in structure and function. Many structural features typical of the historical vegetation, such as snags, dead and downed wood, and brush piles, are often completely removed from the landscape. The original habitats are often replaced by buildings, impervious surfaces, and bridges; and plantings of non-native species are frequently found along streets, in parks and in private gardens. Some human made structures provide habitats similar to those of cavities, caves, fissures, cliffs and ledges and are frequently used by wildlife species.

Remnant, isolated blocks of natural areas often are found scattered in a city or region mixed with a multitude of introduced or exotic vegetation. As urban development increases, these remnant natural areas become fragmented and isolated. In urban and suburban areas, species richness is often increased because of the introduction of exotics. The juxtaposition of exotics interspersed with native vegetation produces a diverse mosaic with areas of extensive edge. Also because of irrigation and the addition of fertilizers, the biomass in the urban communities is often increased. Interest in the use of native plants for landscaping, or naturescaping, is rapidly expanding.

Habitat Types, Status, Threats, and Limiting Factors

From 1970 to 1990, more than 30,000 square miles of rural lands in the U.S. became urban, as classified by the US Census Bureau. From 1940 to 1970, the population of the Portland urban region doubled and the amount of land occupied by that population quadrupled. More people are moving to Oregon and Portland than most other places in the US placing continued pressure on the natural resources. Development and associated urban growth is blamed as one of the single biggest factors affecting the environment. This urban growth is predicted to continue to increase at an accelerated pace, at the expense of native habitat.

Limiting Factors

Biological Stressors

Climate Change

Disruption of Natural Disturbance Regimes

Habitat Fragmentation and Access

Human Disturbance

Pollution

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Westside Upland Grasslands

Hab Code: WEGR

Special Status Habitat(s) within this type: Upland Prairie; Grasslands

General Characteristics

Upland grasslands include a variety of grass-dominated habitats such as upland prairies, coastal bluffs and montane grasslands. In general, grasslands occur on dry slopes or plateaus and have well-drained sandy or loamy soils. Although dominant species vary across Oregon, perennial bunchgrass and forbs dominate native grasslands. In some areas, upland grasslands are similar to wet prairies and wet meadows in structure and share some of the same prairie-associated plants and animals. In all but the most shallow rocky soils, grasslands are maintained through disturbances such as periodic fire, soil upheaval by rodents, frostheave, wind or salt spray. In the Willamette Valley, grasslands, or upland prairies, are dominated by grasses, forbs, and wildflowers. Upland grasslands have well-drained soils and often occur on dry slopes. They are similar to wet prairies in structure and share some of the same prairie-associated plants and animals. Oak savannas are grasslands with scattered Oregon white oak trees, generally only one or two trees per acre. Oak trees in savannas are usually large with well-developed limbs and canopies.

Habitat Status and Threats

As a whole, native grasslands are one of the most imperiled habitats in the western United States and are disappearing rapidly around the globe. In Oregon, the greatest loss of grasslands has been in valley bottoms and foothills where they have been impacted by conversion to agriculture, development, and invasive plant species. In some areas, past grazing has impacted grasslands, affecting plant composition and structure. Also, non-native species were historically seeded for livestock forage in some grasslands, decreasing the abundance and diversity of native plants. However, grazing practices become more sustainable over time, and carefully managed grazing can help maintain grassland structure where prescribed fire is not practical or desired. Disruption of historical fire regimes has allowed for shrubs or trees to encroach, replacing grasslands with forest. In addition, some foothill grasslands have been converted to forests through tree planting. Compared to historic grassland distributions, grassland loss has been extremely high in the Willamette Valley (99 percent estimated loss). Grasslands have been lost due to conversion to other uses, particularly development, vegetation changes following fire suppression, and invasive species. In the Willamette Valley, grasslands are particularly fragmented and isolated. In cooperation with landowners, remnant patches in should be maintained and, where feasible, restored.

Limiting Factors

Biological Stressors

Disruption of Natural Disturbance Regimes

Habitat Fragmentation and Access

Physical Habitat Change

Vegetation Change and Altered Habitat Structure

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Westside Lowlands Conifer-Hardwood Forest **Hab Code:** WLCH

Special Status Habitat(s) within this type: Interior Forest

General Characteristics

In the City of Portland, Interior Forest Habitat is defined as a forest patch of 30 acres in size or greater that is more than 300 feet from the nearest forest edge. Interior forest habitats are buffered from non-forest land and from primary and secondary roads (i.e., roads considered large enough to break the canopy) and transmission right-of-way corridors. Two forested tracts are considered noncontiguous or disjunct if separated by at least 30 feet of non-forested habitat.

Interior Forest Habitat is characterized primarily by physical characteristics, rather than tree or understory species. The scale and shape of interior habitat patches, for example, have an important bearing on their ability to support species dependant on interior habitats. An interior forest is large enough, and of an appropriate shape, to provide conditions that minimize predation, parasitism, and microclimate fluctuations associated with forest edges.

In a fragmented landscape, there are many microclimates within a forest stand. By contrast, interior forest is generally characterized by a relatively stable environment that is cool, dark, humid, and windless. These stabilized climate conditions occur due to the lack of edge effects produced by roads, clear cuts, transmission right of ways, and active forest management.

Interior forest conditions provide critical habitat for a diversity of wildlife and plant species, especially plants, fungus, mammals, birds, amphibians, and invertebrates that are sensitive to isolation disturbances. These species avoid competition with edge associated species. Examples include: Pacific-slope flycatcher and pileated woodpecker.

Habitat Status and Threats

Oregon's forests have long contributed to local economies through timber harvest. However, timber harvests, transportation corridors and utility rights-of-way have replaced interior forest habitats with interrupted patches of forest throughout western Oregon.

Identifying remaining interior forest areas is one means of identifying important habitat areas for specific species dependant upon interior conditions. As such, it can help in the identification of forest habitat conservation opportunities on a regional scale. It also suggests to local decision-makers that special care be taken in the land management and development to avoid interrupting interior forest areas.

Limiting Factors

Biological Stressors

Disruption of Natural Disturbance Regimes

Habitat Change, Degradation and Loss

Habitat Fragmentation and Access

Human Disturbance

Climate Change

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Westside Lowlands Conifer-Hardwood Forest **Hab Code:** WLCH

Special Status Habitat(s) within this type: Late Successional Conifer Forest

General Characteristics

Historically, fire was the major natural disturbance in all but the wettest climatic areas. Depending on local conditions, fires in western Oregon conifer forests were moderate to high severity with fire return intervals averaging from 100 to more than 400 years. The historic fire regime created a complex mosaic of stand structures across the landscape. Late successional conifer forests are defined by the plant species composition, overstory tree age and size, and the forest structure as follows:

Plant species composition - Forests at low to moderate elevations in western Oregon often shift from strong dominance by Douglas-fir in early stages of succession to mixed stands with large amounts of *western hemlock and other tolerant species at mid to late stages in succession*. Other species found in these forests, at various stages of succession, include Western red cedar, big leaf maple, and red alder.

Overstory tree age and size - Late-successional forests have seral stages that include mature and old-growth age classes, and includes forests with greater than 32" dbh with two or more canopy layers.

Forest structure – Late successional forests have a multi-layered tree canopy, with shade-tolerant tree species growing in the understory, and a high volume of dead wood such as snags and logs.

Habitat Status and Threats

Oregon's forests have long contributed to local economies through timber harvest. However, both timber harvests and a number of large fires have replaced much of the late-successional forests with younger forests in western Oregon. Based on a comparison between historic (1850) and current vegetation maps, an estimated 23 percent of late-successional Douglas-fir mixed conifer forests remain in the West Cascades and 8 percent remains in the Coast Range. In the West Cascades, less than 10 percent of historic low-elevation and mid-elevation (more than 4,500 feet) late-successional forests remain.

Federal lands contain substantial acreages of mature and late-successional forests, but many of these forests occur in a patchwork with much younger forests that are managed with shorter rotations to generate timber products. The younger forests still maintain their capacity to become older forests, and they often support many of the same wildlife species. However, late-successional forests support a wide array of species. Many of these species require large patches of these older or mature forests to survive and may be sensitive to changes in the forest seral stage.

Limiting Factors

Biological Stressors

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Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Westside Oak and Dry Douglas-fir Forest and Woodlands **Hab Code:** WODF

Special Status Habitat(s) within this type: Oak Woodland

General Characteristics

Oak woodlands are characterized by an open canopy dominated by Oregon white oak. Depending on the ecoregion and site characteristics, oak woodlands may also include Ponderosa pine and / or Douglas-fir. In general, the understory is relatively open with shrubs, grasses and wildflowers. The tree canopy of an oak woodlands obscures between 30 percent – 70 percent of the sky as you look up at it. Oak habitats were historically maintained through fire, which removes small conifers and maintains a low to moderate shrub cover.

In the Coast Range and West Cascades, oak habitats can be found in drier landscapes, such as south facing slopes and foothills bordering the Willamette Valley. In the Willamette Valley, oaks were originally found in a mosaic of prairies, oak savanna, and riparian habitats throughout the valley floor and low elevation slopes. Oaks were most common on flat to moderately rolling terrain, usually in drier landscapes, and often were found between prairie remnants and conifer forests. Today, oak woodlands often are found in small isolated pockets surrounded by other land-uses, such as development or agriculture.

Oak woodlands grade into oak savannas. Oak savannas are characterized by primarily upland prairie with widely-spaced large Oregon white oak and conifers. Oak savannas are discussed with grasslands.

Habitat Status and Threats

Oak woodlands once covered almost one million acres in the Coast Range and 400,000 acres in the Willamette Valley. However, the Coast Range now has less than four percent of its estimated historic oak woodlands and the Willamette Valley less than seven percent.

Oak woodlands have been impacted by conversion to other land uses, invasive species, and vegetation changes due to fire suppression. As a result of conifer plantings and changes in fire frequency and intensity after European settlement, Douglas-fir is now dominant in many areas of the Coast Range and Willamette Valley foothills that were once oak habitats. Oak habitats continue to be converted to agriculture, residential and other uses in Willamette Valley and the Coast Range foothills. Because much of the remaining oak woodlands are in private ownership and maintenance of these habitats requires active management, cooperative incentive-based approaches are crucial to conservation.

Loss of oaks, particularly large diameter open-structured trees valuable to wildlife, are of particular concern because oak trees have a slow growth rate and require a long time to regenerate, slowing restoration. In addition, reproduction and recruitment of younger trees is poor in many areas.

Limiting Factors

Biological Stressors

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Habitat Fragmentation and Access

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Vegetation Change and Altered Habitat Structure

Habitat Types, Status, Threats, and Limiting Factors

Johnson / O'Neil Habitat Type: Westside Riparian-wetlands

Hab Code: RWET

Special Status Habitat(s) within this type: Bottomland hardwood forest; Riparian habitats

General Characteristics

Riparian habitats are those adjacent to rivers and streams or occurring on nearby floodplains and terraces. Riparian habitats are shaped and maintained through seasonal flooding, scour, and soil deposition. Floods replenish nutrients, recharge groundwater, and reset successional processes. Riparian habitats occur along rivers and streams at all elevations, from valley bottom floodplains to alpine torrents. Riparian habitats also include springs, seeps, and intermittent streams, and many low elevation alluvial floodplains confined by valleys and inlets.

Riparian habitats vary from sparsely vegetated areas to cottonwood gallery forests due to flood dynamics. Plant composition is influenced by elevation, stream gradient, floodplain width, and flooding events. Throughout most of the state, riparian vegetation is mostly dominated by deciduous trees and shrubs, such as bigleaf maple, alders, aspen, cottonwood, dogwood, willows and Oregon ash. In some areas, riparian habitats include some riparian shrublands.

Habitat Status and Threats

Riparian habitats often have high species diversity and are critical for wildlife. These habitats are important to species that prefer moist shrubby or forested habitats. Riparian areas provide essential wintering habitat and travel corridors for songbirds and other wildlife. In addition, riparian habitats have important ecological functions. Healthy riparian vegetation protects banks from erosion, influences in-channel aquatic habitats, maintains favorable water temperature for fish through shading, filters runoff, and provides nutrients. Riparian vegetation creates meanders and increases habitat complexity in valley bottoms. Riparian habitats link upland and aquatic habitats. Upland habitats have a critical role in watershed function and affect riparian and aquatic habitats, particularly in drier, low-elevation sites.

Riparian habitats have declined from historic levels and are now greatly reduced in area and connectivity, especially those in low-elevation areas and valley bottoms. Development, logging, road building, agriculture and pasture use have degraded some riparian habitat directly through decreased riparian vegetation, increased sedimentation, and reduced large wood in streams. Runoff containing fertilizers and other contaminants can further impact habitat.

In the Willamette Valley, riparian forests have significantly declined with increasing development. Many streams now have only a thin strip of riparian vegetation, and some have none.

Limiting Factors

Biological Stressors

Disruption of Natural Disturbance Regimes

Habitat Fragmentation and Access

Vegetation Change and Altered Habitat Structure