GRASSLANDS

Grasslands include a variety of upland grass-dominated habitats, such as upland prairies, coastal bluffs, and montane grasslands.

ECOREGIONS

Grasslands are a Strategy Habitat in the **Blue Mountains**, **Coast Range**, **Columbia Plateau**, **Klamath Mountains**, **West Cascades**, and **Willamette Valley** ecoregions. Additional grassland habitats, such as alkali grasslands, perennial bunchgrasses, and montane grasslands, can also be found in **Specialized and Local Habitats**.

CHARACTERISTICS

Grasslands generally occur on dry slopes or plateaus with well-drained sandy or loamy soils. Although species vary across Oregon, perennial bunchgrasses and forbs dominate native grasslands. In some areas, grasslands are similar to wet prairies and wet meadows in structure and share some of the same prairie-associated plants and animals (wet prairies and wet meadows are included within the **Wetlands Key Habitat**). In all but the shallowest rocky soils, grasslands are maintained through disturbances, such as periodic fire, soil upheaval by rodents, frost heave, wind, or salt spray, and by humans through prescribed fire, grazing, and mowing.

ECOREGIONAL CHARACTERISTICS

Blue Mountains

Bunchgrass grasslands occur primarily in the northeastern portion of the ecoregion, although other grassy habitats occur throughout the ecoregion. At low elevations, semi-desert grasslands are dominated by drought-resistant perennial bunchgrasses, such as needle-and-thread, dropseed, threeawn, and muhly, and may have scattered shrubs. Mid-elevation plateau grasslands include extensive bunchgrass prairies of Idaho fescue, junegrass, and bluebunch wheatgrass. At high elevations, ridgetop balds and alpine parks are dominated by green or mountain fescue, needlegrass, and/or bluegrass species. High-elevation grasslands often are on south-facing slopes surrounded by subalpine conifer woodlands.

Coast Range

Coastal bluff and montane grasslands are dominated by low-growing vegetation, such as perennial bunchgrasses, forbs, mosses, and dwarf shrubs. They occur within a matrix of conifer forests. Outer coastal bluffs and headlands are influenced by wind and salt spray, which limit the growth of woody vegetation. Montane grasslands include dry meadows and balds and occur on dry, south- or west-facing slopes with shallow sandy or gravelly soils. They are primarily influenced by periodic fire, soil upheaval by rodents, and drought conditions.

Columbia Plateau

Grasslands include river terrace grasslands, prairies, canyon slopes, and rocky ridges. At low and mid elevations, semi-desert grasslands are dominated by drought-resistant perennial bunchgrasses, such as needle-and-thread, dropseed, threeawn, and muhly, and may have scattered shrubs. Palouse grasslands occur in flat areas with deep soils and are dominated by bluebunch wheatgrass, Idaho fescue, and other grasses and forbs. Canyon and foothill grasslands are found on the steeper, rocky slopes surrounding the major rivers in this region and are dominated by bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, balsamroot, and other forbs.

Klamath Mountains

Grasslands in the Klamath Mountains are very diverse. They can be found on valley bottoms, and include mounded prairie often associated with vernal pools (upper Rogue Valley and Agate Desert). In the Klamath Mountains ecoregion, dry meadow grasslands and balds occur on south and west facing mid elevation slopes of the Rogue and Umpqua basins, often in a mosaic with chapparal and oak savanna. Oak savannas are grasslands with scattered trees that are usually large with well-developed limbs and canopies. The diversity of grasslands also includes the open serpentine barrens (such as in the Illinois watershed and eastern portions of the Kalmiopsis Wilderness), and in high mountain meadows and glades of the Siskiyou mountains which are a coastal sub-range of the Klamath mountains near the Oregon/California border. The Cascade Siskiyou national monument in the southern range of the Klamath Mountains ecoregion has remaining grasslands comprised of bunch grasses.

West Cascades

Montane grasslands include open dry meadows, grasslands, and balds. Montane grassland habitats occur in a matrix of mixed conifer forests and woodlands. Mid- and high-elevation dry meadows tend to have deeper and better-drained soils than the surrounding forests and are dominated by grasses and wildflowers, such as Roemer's fescue, alpine or western fescue, California brome, timber oatgrass, broadleaf lupine, and beargrass. Balds and bluffs generally occur on south- to west-facing slopes on shallow, well-drained soils and are dominated by bunchgrasses, forbs, and mosses.

Willamette Valley

Grasslands, also called upland prairies, are dominated by grasses, forbs, and wildflowers. Grasslands have well-drained soils and often occur on dry slopes. Willamette Valley grasslands were maintained by indigenous people. Some of the primary species include Roemer's fescue, tufted hairgrass and culturally significant species like camas, brodiaea, and madia. They are similar to wet prairies in structure and share some of the same prairie-associated plants and animals (wet prairies are included within the **Wetlands Key Habitat**). Oak savannas are grasslands with scattered Oregon white oak trees, generally only one to five trees per acre (denser oak stands are included in the **Oak Habitats**). Oak trees in savannas are usually large with well-developed limbs and canopies.

CONSERVATION OVERVIEW

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 estimated loss of grasslands ranges from 50 percent to more than 90 percent, depending on the ecoregion. 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 have become more sustainable over time, and carefully managed grazing can help to 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. Grassland/savanna ecosystems have an outsized role in below-ground carbon sequestration due to fine root turnover (soil carbon accounts for majority of terrestrial pools and is highly stable).

In the **Blue Mountains**, less grassland habitat overall has been lost as compared to the other **Key Habitats**, but grasslands are included because they have statewide and national significance, have been impacted by past grazing practices and need restoration, and because they face threats from invasive species. There are several important grassland sites currently being managed for wildlife and habitat conservation. High-quality grasslands remain at higher elevations and in the extensive canyons in the ecoregion. Native grasslands remain a particular concern at low elevations in this ecoregion.

In the **Columbia Plateau**, Palouse grasslands once dominated most uplands above 1,000 feet in elevation. Due to the moderate climate and deep soils, these grassland habitats are valuable for agriculture. Over 77 percent of the historical Palouse grasslands have been converted to dryland farming, especially wheat and other grains. Many remaining grasslands have been degraded by invasive plants and poorly controlled livestock grazing. In the interior Rogue Valley, grasslands once occupied close to 30% of the Rogue Valley bottomlands. Grasslands on valley bottoms were found in isolated strips and small patches interspersed with oak savanna, oak woodlands, and chapparal. Historically, these mid-slope and valley bottom grasslands in this ecoregion were maintained by frequent burning and included scattered deciduous and conifer trees.

In the **Coast Range**, open, grassy habitats once occurred on the marine terrace, headlands, bluffs, higher elevation ridges, and mountain peaks. In forested ecoregions, such as the Coast Range and West Cascades, grasslands are particularly important for rare plants and invertebrates. In the Coast Range, mountaintops, such as Saddle Mountain, Onion Peak, Sugarloaf Mountain, and Blue Lake Lookout, host a number of endemic plant species, including Saddle Mountain bittercress, Chambers' paintbrush, frigid shootingstar, queen-of-the-forest, and Saddle Mountain saxifrage.

Compared to historical grassland distributions, grassland loss has been extremely high in the Coast Range, West Cascades, and Willamette Valley ecoregions. Grasslands have been lost due to conversion to other uses, particularly development, vegetation changes following fire suppression, and invasive species. In these ecoregions, grasslands are particularly fragmented and isolated. In cooperation with landowners, remnant patches in these ecoregions should be maintained and, where feasible, restored.

Species of Greatest Conservation Need (SGCN) associated with grasslands vary by ecoregion but include the: **Burrowing Owl**, **Common Nighthawk**, **Grasshopper Sparrow**, **Long-billed Curlew**, **Ferruginous Hawk**, **Oregon Vesper Sparrow**, **Streaked Horned Lark**, **Western Bluebird**, **Western Meadowlark**, **Fender's blue butterfly**, **hoary elfin butterfly**, **Kincaid's lupine**, **Oregon silverspot butterfly**, **Taylor's checkerspot butterfly**, **Coast Range fawn lily**, **Cascade Head catchfly**, **Lawrence's milkvetch**, **Spalding's campion**, and **Tygh Valley milkvetch**.

LIMITING FACTORS AND RECOMMENDED APPROACHES

Limiting Factor: Altered Fire Regimes

At sites with deep soils, maintenance of grasslands is dependent, in part, on periodic fire. Fire suppression has led to encroachment by shrubs and conifer trees in some areas. Fire suppression has aided in an increase in fuel loads, which can lead to high-intensity wildfires. The introduction and rapid spread of cheatgrass and other non-native grasses throughout eastern Oregon can increase the frequency, intensity, and spread of fires. In the Willamette valley in particular, grasslands and the species that inhabit them, are dependent on managed fire due to coevolution with Tribal fire management practices. In the Coast Range, prescribed fire is difficult due to high precipitation and wet conditions. When conditions are dry enough to use prescribed fire, there are usually concerns with risk to surrounding forests. In the Klamath Mountains and Willamette Valley, prescribed fire poses challenges, such as conflicts with surrounding land use, smoke management and air quality, and safety.

Recommended Approach

Maintain open grassland structure by using multiple site-appropriate tools, such as prescribed burns, mowing, controlled grazing, selective use of herbicide, hand-removal of encroaching shrubs and trees, or thinning. Re-introduce fire at locations and at times where conflicts, such as smoke and safety concerns, can be minimized. Look for opportunities to update smoke management and air quality standards in order to do more fall, winter, and spring burn windows. For all tools, minimize ground disturbance and impacts to native species. Minimize the spread of cheatgrass. Carefully manage livestock grazing to maintain native plants and soil crust (cryptogrammic crust) in low cheatgrass areas. Control fires in cheatgrass-dominated areas. (KCI: **Disruption of Disturbance Regimes**)

Limiting Factor: Invasive Species

Invasive plants are degrading grassland habitats, displacing native plants and animals. Depending on the area, invasive species include cheatgrass, medusahead, ventenata, rush skeleton weed, spikeweed, Hungarian brome, yellow star-thistle, knapweeds (diffuse, spotted, and purple), leafy spurge, Canada thistle, St. John's wort, tansy ragwort, Armenian (Himalayan) blackberry, evergreen blackberry, Scotch broom, false-brome, Harding grass, and tall oatgrass. Most low-elevation grasslands are almost entirely dominated by invasive grasses, forbs, and shrubs. In the Blue Mountains and the Columbia Plateau, juniper encroachment has displaced grasslands in many areas. At higher elevations, such as montane grasslands in the West Cascades, invasive plants are less common. However, these habitats need to be monitored to detect new invasive species as

livestock (e.g., cows, pack horses, riding horses) can introduce invasive plants. Disturbed sites are especially prone to invasive species establishment.

Recommended Approach

Identify remaining native grasslands and work with landowners to maintain quality and limit the spread of invasive species. Emphasize prevention, risk assessment, early detection, and quick control to prevent new invasive species from becoming fully established. To control encroaching junipers, use mastication, cut and pile, lop and scatter, or cutting for firewood. Develop markets for small juniper trees as a special forest product to reduce restoration costs. Prioritize control efforts and use site-appropriate methods to control newly established invasive plant species for which management can be most effective. Promote the development of additional native seed resources. Re-seed with site-appropriate native grasses and forbs after control efforts. Conduct research to determine methods to manage established species, such as cheatgrass, medusahead rye, Hungarian brome, and annual ryegrass. Where appropriate, manage livestock grazing and recreational use, especially motorized use, to minimize new introductions. Support current prevention programs, such as weed-free hay certification. (KCI: **Invasive Species**) Establish and implement management plans for all soil-disturbing activities. Clean vehicles and other equipment when relocating between sites where invasive species are present.

Limiting Factor: Land Use Conversion

Remnant grasslands are subject to conversion to agricultural, residential, urban, energy, and infrastructure uses.

Recommended Approach

Because many of these areas are privately-owned, **voluntary cooperative approaches** are the key to long-term conservation. Important tools include financial incentives, technical assistance, regulatory assurance agreements, and conservation easements. Use and extend existing incentive programs, such as the Conservation Reserve Program and Grassland Reserve Program, to conserve, manage, and restore grasslands and to encourage no-till and other compatible farming practices. Support and implement existing **land use regulations** to preserve forest land, open spaces, recreation areas, and natural habitats. Thoughtful land use planning can help prevent large scale conversion from agriculture to more intensive development.

Limiting Factor: Land Management Conflicts

Resource conflicts can arise because high quality grasslands are often high-quality grazing resources. Although grazing can be compatible with conservation goals, it needs to be managed carefully because Oregon's bunchgrass habitats are more sensitive to grazing than the sod-forming grasses of the mid-western prairies. Overgrazing can lead to soil erosion, changes in plant species composition and structure, and degradation by invasive plants. Grassland management practices, such as mowing, haying, burning, and herbicide/insecticide application during the nesting season, can be detrimental to species.

Recommended Approach

Use incentive programs and other voluntary approaches to manage and restore grasslands on private lands. Manage public land grazing to maintain grasslands in good condition. Conduct

research and develop incentives to determine grazing regimes that are compatible with a variety of conservation goals. Promote operation of grassland management practices (e.g., mowing, haying, burning, and herbicide application) outside of the primary breeding season (roughly April-August). Restore native grassland habitat when possible, removing woody growth and invasive weeds to create a mosaic of clumped vegetation, bare ground, and a mixture of grasses and forbs with a variety of heights. Promote use of native plants and seed sources in conservation and restoration programs.

Limiting Factor: Reduction of Habitat Patch Size and Connectivity

In the Columbia Plateau and Willamette Valley ecoregions, grassland habitats often occur in small patches, such as roadsides and field edges. These patches are valuable habitat for some species, especially some plants and invertebrates. However, many grassland-obligate species (e.g., grassland birds) require large patch sizes for nesting. These species tend to avoid edge habitat and areas of dense woody vegetation, which can harbor predators. Small grassland patches also increase the potential for negative impacts from adjacent lands (e.g., herbicide and pesticide drift). Poor connectivity between remnant patches can limit dispersal capabilities for some species.

Recommended Approach

Maintain or restore grassland habitat considering patch size, shape, vegetation structure, and plant composition that best benefits **SGCN Species**. Maintain high priority patches and improve connectivity between similar habitat types. Use a landscape approach in conservation plans and incentive programs to create large, contiguous blocks of grassland habitat by expanding buffers around key grassland sites. Connect grassland habitats, such as fallow fields, pastures, and natural meadows, to create contiguous grassland habitat and improve connectivity between patches. Seek partnerships with federal agencies and non-profits. Identify high priority areas for large scale connectivity and work with private landowners and federal lands to increase footprint of work being done.

Limiting Factor: Loss of Habitat Complexity in Oak Savannas

In the Klamath Mountains and Willamette Valley ecoregions, large-diameter oak trees with lateral limb structure and cavities continue to be lost. **Oak Habitats** complement grassland habitat and should be maintained. Many native wildlife utilizes large-diameter oaks for nesting, feeding, and shelter. Klamath mountains likely had more oak woodland than oak savanna.

Recommended Approach

Maintain large oaks, remove competing conifers or densely stocked small oaks, and create snags to provide cavity habitat.

Limiting Factor: Recreational Impacts

In some grasslands in the Coast Range, Klamath Mountains, Willamette Valley, and West Cascades ecoregions, recreational use impacts grassland species and vegetation. Some grassland-obligate species are highly sensitive to disturbance during the breeding season from people, pets, and recreational activities.

Recommended Approach

Work with land managers to direct recreational use away from highly sensitive areas. Provide recreational users with information on grassland issues and low impact uses.

HABITAT CHANGE TRENDS ANALYSIS

There is significant concern regarding annual grass invasion of both Grassland and Sagebrush Habitats. Institute for Natural Resources (INR) conducted an analysis using the Rangeland Analysis Platform (RAP) annual vegetation cover maps to track the total area that is dominated by annual grasses in Oregon in 1986, 2001, 2016, and 2023. The analysis documents significant increases in annual herb-dominated vegetation since 1986. While the RAP annual herb maps include both annual grasses and annual forbs, INR believes the observed pattern to primarily reflect ongoing increases in annual grasses since they tend to dominate the vegetation in Oregon's grassland and sagebrush habitats. Annual plant cover in any one year is variable and some inter-annual variation is expected. For example, wetter spring conditions tend to increase annual vegetation cover.

RESOURCES FOR MORE INFORMATION

- **Prairie Vegetation Monitoring Protocol for the North Coast and Cascades Network**
- **The Willamette Valley Landowner's Guide to Creating Habitat for Grassland Birds**
- **Partners in Flight Conservation Strategy for Landbirds in Lowlands and Valleys of Western Oregon and Washington**
- **Benton County Prairie Species Habitat Conservation Plan**
- **Declining and State Sensitive Bird Species Breeding in the Willamette Valley Grasslands: 2008-09 Status Update**
- Prairie, Oaks, and People – A Conservation Business Plan to Revitalize the Prairie-Oak Habitats of the Pacific Northwest
- Cascadia Prairie Oak Partnership Technical Library of Resources: https://cascadiaprairieoak.org/technical-library
- Klamath Bird Observatory/Klamath Siskiyou Oak Network's Landowner restoration guide: https://klamathbird.org/tag/oak-landowner-guide/
- Patterns of Vegetation Change in Grasslands, Shrublands, and Woodlands of Southwest Oregon: https://www.blm.gov/or/districts/medford/files/pattvegchange.pdf

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