Oak Woodlands and Savannah (adopted from Lomakatsi Restoration Project Guidelines)[1]

Oak woodlands composed of hardwood species, shrubs, forbs, and occasional conifers not only provide habitat for wildlife and pollinators, but they also add landscape complexity, provide gaps that impede the spread of fire and often provide a transition between forests and rural and urban communities. A broad range of unique stand structures and habitat type are apparent in Pacific Northwest oak ecosystems (i.e., Engber, 2010), and each requires different management. Some stands are single stemmed trees with broad canopies that are widely spaced (savannah), others are more densely spaced, forming continuous canopies of single- and multiple-stemmed oaks (woodland). Within stands, individual oaks may be single-stemmed or consist of many stems originating from the same parent root system or root collar (oak cluster). Oak stands that were historically dominated by white and/or black oak and that have been encroached with younger conifers, younger oaks, other hardwoods, or shrubs would be treated to restore historical stand densities and stand structures.

The purpose of these treatments is to improve stand growth and maintain health and vigor by reducing moisture stress on the older cohorts, improving and maintaining structural diversity and reintroducing fire as an ecological process.

Objectives:

- Reduce encroachment of young (15- 60 years) conifers and woody shrubs in areas dominated by large oaks
- Reduce stand basal area to historic (if known) or the older cohort stand density, while retaining some younger oaks for recruitment
- Improve habitat conditions for targeted neotropical birds and woodpeckers, and in some areas forage conditions for deer and elk
- In areas where conifers are natural associates within oak woodlands, leave a wide spacing (<10 trees/acre) of recruitment age conifers with special consideration for ponderosa pine and sugar pine
- Retain single-stemmed oaks in all age/size categories
- Retain legacy conifers and protect snags and down wood
- Restore fuel loading and arrangement to levels characteristic of low and mixed severity fire regimes depending on site, topography and adjacent stand conditions
- Reduce nonnative vegetation and promote fire-dependent species regeneration through prescribed fire
- Reduce stand densities to promote shrub and herbaceous species diversity
- Reduce potential for nonnative plant encroachment
- Design treatments to enhance or improve habitat for Special Status plants while avoiding direct impacts

[1] Cocking, Matthew I., 2011. Thinning guidelines for ecological enhancement of Oregon white oak (*Quercus garryana*) stands with recent or non-existent conifer invasion. Lomakatsi Restoration Project, Ashland, OR.
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Treatments:

Oak Woodland and Savanna Structures – Conifer Encroached Treatments
Treatments of conifers would be heavy in Oregon white oak savanna and woodland ecosystems where historic data and site characteristics (i.e., numerous large, overstory oaks) indicate pre-fire-suppression dominance.

- Remove Douglas-fir, white fir and incense cedar less than 12 inches and occasionally larger conifers (up to 18 inches) where tree growth is rapid
- Retain all legacy conifers > 150 years
- Retain all pine in the oldest cohort
- If large conifers are desired but are missing from the stand, retain some smaller trees for legacy tree recruitment
- Plant to restore oak, pine and native grasses to disturbed areas, if needed, using appropriate site specific species
- Prescribe burn to reduce small tree and shrub competition and to stimulate native species dependent on fire for reproduction
- Oak clusters should be treated as single stems with regard to encroaching vegetation removal
- Removal of encroaching vegetation would be heavy while thinning and pruning of existing oaks would be light or not performed at all

Single-Stem Treatments
Single-stemmed oaks in all age/size categories should be retained and protected from significant encroaching vegetation unless a smaller single stemmed oak is within the drip-line of a larger oak or oak cluster.

- Remove shrubs, conifers, and significantly smaller hardwoods within the drip-line of large single-stemmed oaks
- Prescribe burn to reduce small tree and shrub competition and to stimulate native species dependent on fire for reproduction
- Remove sprouting suckers that are <3 inches dbh and significantly shorter than the main stem
- Old single-stem oaks with heavy infestations of mistletoe may need the mistletoe removed to preserve old trees

Oak Cluster Treatments
Oak clusters are defined as groupings of oak stems that arise from the same root collar (i.e. are all part of one organism, or when they arise from the ground closely enough that distinction between individual organisms is not discernible (Engber 2010).

- Treat oak clusters as single stems with regard to encroaching vegetation removal
- Retain all live stems within the oak clusters that are >1/5 the dbh of the largest stem or that comprise 10% or more of the overall cluster canopy crown
- Any thinning performed in oak clusters would not reduce the overall cluster crown volume by more than 10%

- Dead stems within oak clusters should only be removed if burning of such stems during prescribed fire may harm existing live stems
- Prescribe burn to reduce small tree and shrub competition and to stimulate native species dependent on fire for reproduction

Continuous Woodland Treatments
Areas with continuous oak canopy that are not oak clusters should be treated for removal of encroaching vegetation on dominant and co-dominant oaks (and legacy conifers where they exist)

- Do not reduce overall oak and legacy conifer canopy cover (dominant conifers and co-dominant oaks) in continuous oak woodlands by more than 10%
- Thin most brush and young conifers from the stand to mimic a low severity fire
- Remove encroaching vegetation around dominant and co-dominant oaks (and legacy conifers where they exist)
- Remove conifers that have grown into or through older, large-crowns oaks
- Thin younger and suppressed oak stems, especially when small oaks or oak clusters exist within the drip-line of a larger oak or oak cluster
- Retain adequate recruitment-age oaks for future replacement of the overstory, especially if many seriously moribund, mistletoe, and fungal infected large oaks are present
- Prescribe burn to reduce small tree and shrub competition and to stimulate native species dependent on fire for reproduction

Low-Branch/Edge Structure Protection
Low branch structure in oak and large conifers is common along woodland edges (ecotones between savannah, meadow or chaparral borders) and on open-grown trees or oak clusters.

- Retain branches >3 inches in diameter on single-stem oaks or stems within oak clusters
- Branches that provide cavities, notches, and horizontal or arching form would be retained unless there is a safety issue
- In woodland interiors, retain a proportion of these large limbs and unique structures where possible
- Retain large limbs that have died

Meadow & Grassland Restoration

Grassland communities are dominated by grasses and forbs. In southwestern Oregon they include forest openings created and maintained by wildfire and areas where woody plant growth is limited by soil type or depth, water table levels, or aspect and precipitation. These meadows provide important habitat for a variety of native plants and wildlife, but over the last 150 years fire exclusion, conversion to agricultural fields, overgrazing, invasion of non-native grasses and noxious weeds, and OHV and vehicular use have significantly reduced the extent of these grasslands and degraded the remaining examples.

The purpose of these treatments is to restore native species, enhance habitat for wildlife and native plants, including rare species, and repair damage from OHVs and vehicles. Treatments would be tailored to meet specific ecological objectives for each site, depending on the grassland

type and existing and desired future conditions. The following objectives address a range of conditions and would not be applicable to every site.

Objectives:

- Reduce encroachment of young conifers (seedlings to 60 years) in and around the edges of grasslands.
- Remove grass thatch build up to reinvigorate native grasses.
- Remove nonnative grass thatch to provide open areas for seeding appropriate site specific native species.
- Remove a percent of decadent shrubs, when present, to allow regeneration of species that deer and elk browse. Leave 25% of shrub patches untreated for bird and small mammal cover.
- Design treatments to enhance habitat for Special Status plants while avoiding impacts to populations.
- Treat noxious weeds before treatments and monitor and retreat after as needed.
- Protect coarse woody debris, snags and other unique legacy features such as large conifers and oaks.
- Restore open areas to improve deer and elk forage and enhance habitat for meadow dependent species.
- Rehabilitate areas damaged by OHVs or vehicles
- Where possible, tie in grassland treatments with fuels reduction treatments in adjacent woodland stands to increase defensible space within the Wildland Urban Interface (WUI).

Treatments:

- Utilize broadcast burning or handcut and pile to remove encroaching conifers and shrubs.
- Utilize broadcast burning to reduce grass thatch build-up of native or nonnative grasses.
- Pretreat noxious weeds or other nonnative species, conduct post-burning monitoring, and retreat as needed.
- Seed or plant appropriate site-specific native plants after broadcast burning to restore native plant composition.
- Retain down wood and snags and other unique legacy features.
- Rehabilitate tire tracks or roads by ripping or blading and seeding with native species.

Chaparral Shrublands

Southwest Oregon chaparral is composed of dense, evergreen, drought-tolerant shrubs found at low to mid-elevations in the interior valleys. Flora and fauna supported by this vegetation type are fairly uncommon and unique; species of concern are also documented in this habitat type (Hosten et al 2006).

Chaparral in southern Oregon has not been studied extensively and prescriptions are still being developed (Duren and Muir 2010). Chaparral tends to burn at a high severity; however, high severity fires are important to chaparral persistence because they clear encroaching trees and high heat stimulates better seed germination than occurs without fire. Typically robust chaparral

in southwest Oregon is uneven-aged because recruitment continues over time and is not totally dependent on disturbance.

Though fires typically burn in southwest Oregon chaparral shrublands at a high severity, there are usually some shrub survivors. Robust chaparral is slow growing and there needs to be enough time between fires for new shrubs to reach maturity and build up replacement-level seed banks.

Objectives:

- Prioritize treatments in WUI or where wildlife habitat objectives can be met
- Develop site-specific wildlife and botanical habitat objectives
- Reduce decadent shrub density to allow for regrowth to improve deer and elk forage conditions and provide better travel routes for a variety of wildlife species
- Restore open areas to provide habitat for early seral dependent species.
- Restore or maintain heterogeneity across the landscape
- Design treatments to enhance habitat for Special Status plants while avoiding impacts to populations.
- Prevent or mitigate nonnative plant invasion
- Vary treatments across the landscape to maintain stands in various age classes
- Repeat treatments no sooner than 20 years

Treatments:

- Remove most shrubs but retain medium to large-sized shrubs whose trunks add up to 35 square feet per acre
- Burn the cut area at a temperature that will stimulate seed germination of shrubs and forbs but will also protect or maintain soil productivity
- Leave large patches untreated
- Implement prescribed burns consistent with wildlife and botanical objectives
- Leave some stands within each watershed untreated
- Allow a dense shrub canopy to regenerate quickly
- Treat nonnative plant invasion
- If needed, restore native species appropriate to the site through seeding or planting

References

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Hosten, P. E., O. E. Hickman, et al. (2006). "Oak woodlands and savannas." Restoring the Pacific Northwest: the art and science of ecological restoration in Cascadia. Island Press, Washington, DC: 63-92.

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