Columbia Land Trust: Pioneering Oak Woodlands Restoration

Project summary: The Columbia Land Trust is working to restore oak woodlands on two properties: a “mosaic” thinning project on a 580-acre property and one to reduce conifer encroachment on a 300-acre property.

Regional Setting: With its headwaters in British Columbia, the Columbia River travels over 1243 miles to reach the Pacific Ocean. The Columbia River Basin is a varied landscape of mountains, high plateaus, desert basins, river valleys, rolling uplands and deep gorges woven together by the Columbia River and its tributaries. The Columbia Basin's varied landscapes provide habitat for 609 known fish and wildlife species, including some rare and endangered species: bull trout, sockeye salmon, bald eagles, gray wolves, grizzly bears and even the elusive Canada lynx.

The Columbia River has been dramatically altered by development and hydropower dams; in fact, the Columbia River Basin is the most hydroelectrically developed river system in the world. Dams on the Columbia have contributed significantly to steep declines in historically strong fish runs. Since the 1950s, the combined consequences of dams, increased ocean fishing, deterioration of stream and river habitats and changing river conditions have made the Columbia less and less habitable for salmon as well as other wildlife that depend on the river for survival.

Land Trust Mission: The Columbia Land Trust conserves signature landscapes and vital habitat together with the landowners and communities of the Columbia River region.

Service Area: Columbia River in Washington and Oregon.

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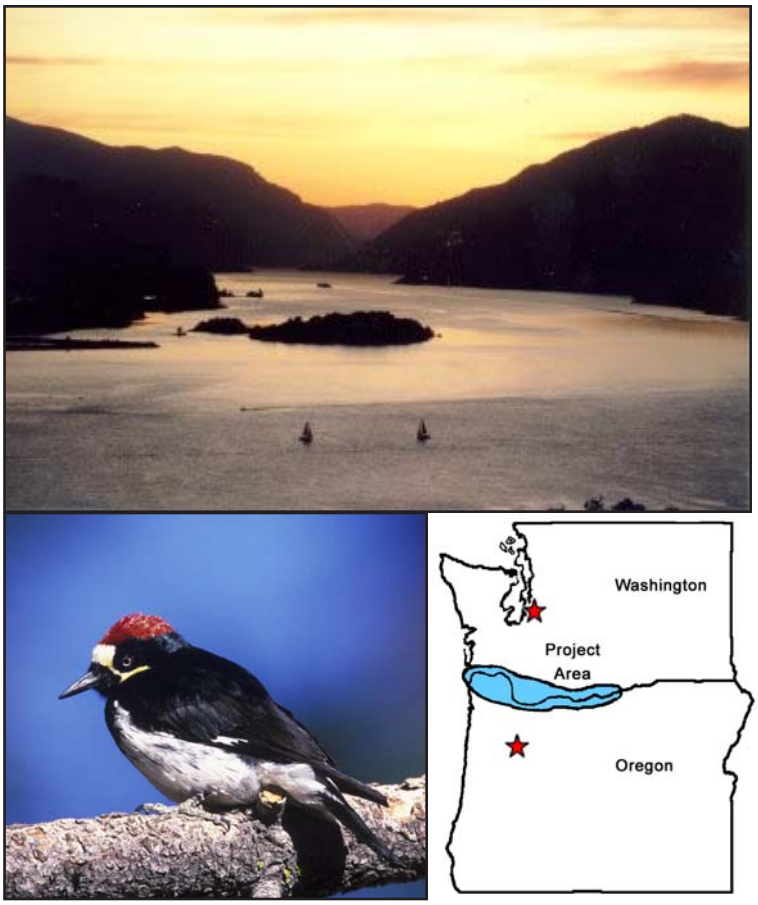


Top: The Columbia Gorge at sunset. Lower right: Project area in Oregon and Washington. Lower left: Acorn woodpecker, photo courtesy of the U.S. Fish and Wildlife Service.

Biodiversity Values

Klickitat County, in the eastern Columbia River Gorge, contains some of the most extensive oak woodlands and savannas in Washington State. This dry landscape of steep canyons provides valuable habitat for over 200 species of wildlife, including the state-listed Western gray squirrel. Other at-risk species include the California mountain kingsnake, Lewis woodpecker and acorn woodpecker. Klickitat County has some of the largest breeding populations of Lewis woodpecker in the Pacific Northwest and the northern-most active nesting colony of acorn woodpeckers.

Oak habitat is threatened in the Pacific Northwest by development, land use conversion, fire suppression and the

encroachment of conifers. The loss of oak woodland habitat already exceeds 80 percent in some areas and as much as 90 percent of the remaining habitat is currently in private ownership.

Oak habitat on the Klickitat River evolved in concert with a fire regime in which relatively cool understory fires burned every five to 10 years. Suppression of these fires enabled fire-intolerant Douglas fir trees, which dominate forests on

High density oak woodland, pre-thinning. Photo courtesy of the Columbia Land Trust.

the west side of the Cascades, to flourish on the east side, out-competing oak and pine. As oak woodlands disappear, wildlife and plant species that rely on this community type disappear or are forced into increasingly smaller areas.

The Washington Department of Fish and Wildlife has designated the state's oak woodlands as a priority for restoration and conservation. Removal of fire from this

Post-thinning oak woodland with slash piles. Photo courtesy of the Columbia Land Trust.

system has also resulted in an increased density among surviving oaks because small saplings that would have perished in fires continued to grow. The resulting "doghair" oaks (densely packed, small-diameter trees with undeveloped or awkward crowns and branches) do not provide the numerous large cavities for wildlife their larger predecessors once did. Acorn production, an important resource for wildlife, is also suspected to be significantly lower than in more openly grown oak communities.

Unlike many remnant oak sites in western Washington and Oregon's Willamette Valley, the oak woodlands in this area often have relatively intact understories, dominated by native species.

Restoration Strategy

The Columbia Land Trust is conserving and restoring oak woodlands along the Klickitat River to encourage larger, more productive oak trees and native ground cover for use by vulnerable species like western gray squirrel and Lewis' woodpecker. Protecting the savanna from erosion improves the quality of spawning habitat for salmon in the river's tributaries, while deer, bear, bald eagle, amphibians and reptiles benefit from the improved upland and riparian habitats. Habitat restoration provides a critical but less obvious benefit to both people and wildlife: a reduced threat of catastrophic fire.

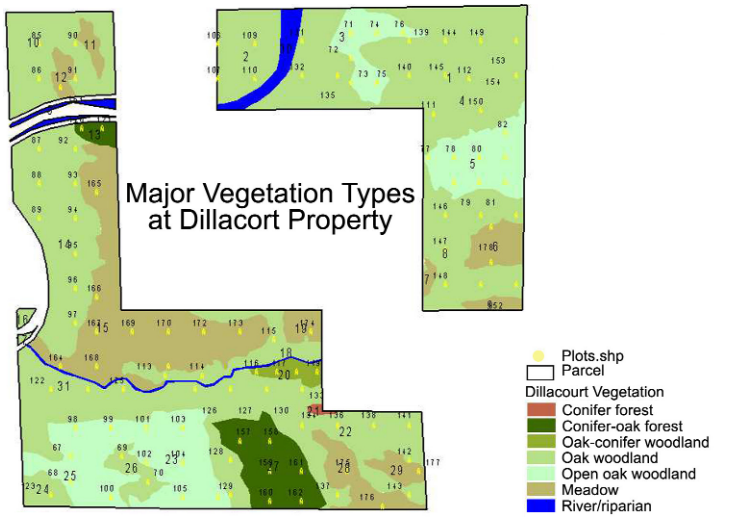
The science of oak woodland management is still developing. Questions center on what kind of oak woodland is the most important for the greatest number of species. Stewardship planning considers acorn production as a food source, influence of fire on community development, cavities for nesting wildlife, snags for animals that feed on insects,

Aerial view of the project area, post treatment. Photo courtesy of the Columbia Land Trust.

downed and woody debris for shelter and understory plant composition. Challenges include the presence of non-native weeds, protecting water sources for riparian and instream habitats and ensuring forest health. The steep ravines and rugged nature of the landscape also amplify the challenges of managing these lands for conservation.

With these questions and challenges in mind, the Columbia Land Trust worked closely with Integrated Resource Management, the local community and state and local agencies to plan its oak woodlands restoration work. Baseline documentation included botanical and wildlife surveys and a forest and road inventory. The land trust installed a network of 170 permanent GPS referenced vegetation sampling and digital photo points and collected data on trees, understory vegetation, noxious weeds, snags and down wood. The land trust developed a restoration target, or desired future condition, after considering wildlife habitat needs of focal species, fire effects, historic conditions and management constraints and opportunities presented by individual sites.

As a result of this extensive documentation, the Columbia Land Trust created a multi-year plan to restore mature oak structure and native understory cover and reduce fire danger on its properties within the Klickitat drainage. Initial steps in the plan call for selective thinning of forests to allow larger, more productive trees to flourish. Subsequent treatments will include prescribed burning, native grass seeding, herbicide control of noxious weeds and re-establishment of native bunchgrasses. Monitoring will include repeat photography and re-measurement of permanent inventory plots, monitoring for noxious weeds, acorn counts and wildlife surveys.



Dillacort Creek oak woodland restoration project. Image courtesy of the Columbia Land Trust.

Two Restoration Projects

Columbia Land Trust is tackling restoration head-on and working on two oak woodlands restoration projects: Dillacort Creek and Logging Camp.

Dillacort Creek

In 2001, the Columbia Land Trust acquired 580 acres of oak and pine woodlands along Dillacort Creek and the Klickitat River. A generous local rancher donated 200 acres of his working cattle ranch and a grant from the Washington Salmon Recovery Board provided the money to purchase the remaining 380 acres. As a result of excellent stewardship of the property, the relatively undisturbed oak and pine woodlands support abundant wildlife. Native bunchgrasses and flowers prevail on the hillsides and the creek corridor is green with alder and other riparian plants. However, the

Volunteer work party removing knapweed and houndstongue from Dillacort property. Photo courtesy of the Columbia Land Trust.

Dillacort Creek oak woodland post restoration. Photo courtesy of the Columbia Land Trust.

impacts from grazing are still noticeable. The understory plant composition in heavily grazed areas is dominated by dogtail grass and some cheatgrass, both non-native invasive annual grasses. There are remnant native understory species such as bluebunch wheatgrass and Idaho fescue and the land trust is seeking to bolster these populations through restorative activities. In addition, the creek bed was badly scoured in the 1996 floods, removing much of the streamside vegetation that provided shade and extended the life of the pools during the late summer. The land trust intends to do some restoration along Dillacort Creek sometime in the future.

While the land trust was evaluating the property to manage it for fish and wildlife habitat, the land trust saw the opportunity to restore some oak woodlands. In the summer of 2004 "mosaic thinning" (an approach whereby retained trees are variably distributed) was applied on 130 acres using a combination of hand falling and piling and mechanical sheering using the Lightfoot, a small rubber tracked machine that allows low-impact tree harvesting and brush reduction. The treatment included an experimental thinning approach around identified western gray squirrel nests to reduce impacts to nesting squirrels. This thinning prescription reduced fuels and fire risk and released oak and pine from competition with neighboring trees while maintaining aerial "escape corridors" radiating out from nest trees. The treatment increased down wood levels by leaving coarse woodpiles, while reducing fine fuels ("kindling" sized pieces) which contribute to high intensity fire behavior.

The main thinning process has been completed for this property and the land trust is now monitoring the results and starting to focus on the understory. The trust started work in 2005 on some understory trial plots to test seven different treatments to restore native grasses and is still in the process of monitoring those test plots. Initial results

Western gray squirrel. Photo courtesy of Washington Department of Fish and Wildlife.

Partners and resource professionals discuss oak release and thinning projects. Photo courtesy of the Columbia Land Trust.

suggest the use of fire is key, but the implementation of fire across the larger landscape may not be economically or politically viable due to challenges associated with air quality, safety and physical constraints such as weather, timing (burn season) and topography.

Logging Camp

In 2003, the same conservation-oriented rancher who worked with the Columbia Land Trust on the Dillacort Creek property sold at a bargain sale another 300 acres just five miles from the Dillacort Creek property.

Logging Camp Creek provides one of the last and best vestiges of quality spawning and rearing habitat accessible to steelhead and coho salmon in the lower Klickitat watershed. It has a mature forest of Douglas fir and ponderosa pine on the north-facing canyon slope and oak and pine woodland on the south-facing slope. The property is remote and provides undisturbed habitat for western grey squirrel, migrating songbirds, cougar, bear, coyote, deer and other wildlife. The understory is dominated by elk sedge and bunch grasses, the riparian areas are in tact and the property on the whole is largely undisturbed. The Columbia Land Trust will manage the Logging Camp Canyon forest and creek to enhance wildlife habitat and forest health and reduce invasive species. One of the first steps in restoring this property was to address conifer encroachment in the oak and pine woodlands. In 2004, the land trust removed conifers to release the oaks on 60 acres and is now monitoring the property. The next focal area will be the understory. The trust plans to re-establish native grasses on the Logging Camp property and control noxious weeds and invasive species.

Conifer encroachment on oak woodlands, Logging Camp project. Some areas were too far gone to warrant oak release, due to unhealthy crowns on existing oak trees.

Funding For Restoration

Thinning treatments were made possible by a grant from the Bureau of Land Management and Forest Restoration Partnership. Additional funding was provided by the Wildlife Forever Foundation and Washington State Department of Fish and Wildlife Landowner Incentive Program (WDFW LIP). The Columbia Land Trust has received a grant from the National Fish and Wildlife Foundation Native Plant Conservation Initiative to implement the native plant understory trial restoration plots and to apply the most practical and effective technique to a larger 10-acre area. This project was also partially funded by the WDFW LIP grant.

Lewis' woodpecker. Photo courtesy of the U.S. Fish and Wildlife Service.

Using Volunteers

Volunteers have helped with much of the restoration work, assisting with: wildlife, legacy tree, acorn crop, rare plant and noxious weed surveys; weed removal; marking and cutting small trees; building and burning slash piles; and

Volunteers installing the burn plots at the Dillacort property as part of the understory restoration trials. Photo by the Columbia Land Trust.

Forester and ecologist Darin Stringer looking at native grass germinants. Photo by the Columbia Land Trust.

seeding and surveying trial plots. Volunteer crews helped light and control the experimental understory burn in several of the trial plots and will continue to be involved in the implementation of future understory restoration and maintenance activities.