

# Oak Woodlands and Chaparral



Klamath Bird  
Observatory

*Aligning chaparral-associated bird needs with oak woodland restoration and fuel reduction in southwest Oregon and northern California*



## Why conservation is needed

Oak woodland habitat in southwest Oregon and northern California is comprised of a vegetation gradient that includes oak savanna, open oak woodlands with grass or chaparral understory, closed canopy oak woodlands, and oak conifer forests. Oak habitats are at risk due to development, encroachment of coniferous forest, invasion of exotic species, and lack of oak regeneration. Birds and other wildlife that depend on these ecosystems have been negatively affected by habitat threats.

## What is chaparral and why is it important for birds?

“Chaparral” is a short, shrubby vegetation type that can be composed of a variety of plant species. In this region, chaparral habitat is often associated with oak woodlands. Chaparral is a natural part of oak habitats, but it also poses a risk of spreading severe fire which can put large, old oak trees at risk. Because oak woodlands are threatened by loss and degradation, management initiatives sometimes reduce chaparral to reduce the risk of high severity fire and promote a mix of low to moderate severity fire.

Still, functioning oak woodland mosaics in southern Oregon need many types of vegetation cover, including patches of chaparral. Restoring and managing oak woodland ecosystems in this region requires learning how to best achieve a balanced vegetation composition that includes chaparral habitat components.

KBO, in partnership with the Klamath Siskiyou Oak Network, has conducted studies to determine how we might best manage oak and chaparral habitat for bird species. We use birds as focal species to provide rapid assessment of overall management activities and a benchmark for oak habitat restoration goals.



*Chaparral provides habitat for some species with recent population declines, such as the Wren-tit.*

# A history of management challenges

Despite the importance of shrubs for birds and other wildlife, land managers are often concerned about leaving shrub patches because of the risk of wildfire. Frequent mixed, low to moderate severity fires are an important component of healthy oak habitats and can help control non-native grasses, but large



Photo © John Paul

severe fires can be detrimental to oak trees. So how can managers reduce fuel loads while still providing enough cover for chaparral-associated bird species? Understanding how birds respond to restoration projects can help inform ongoing management in oak-chaparral systems.



Photo by Bob Altman

## What we do

KBO uses standard protocols to survey for birds, which are easy to monitor and respond quickly to changes in vegetation. Each species serves as a measuring stick, telling us whether specific habitat needs are being met. Understanding whether the presence or abundance of each species changes following restoration is a useful tool for evaluating management success.

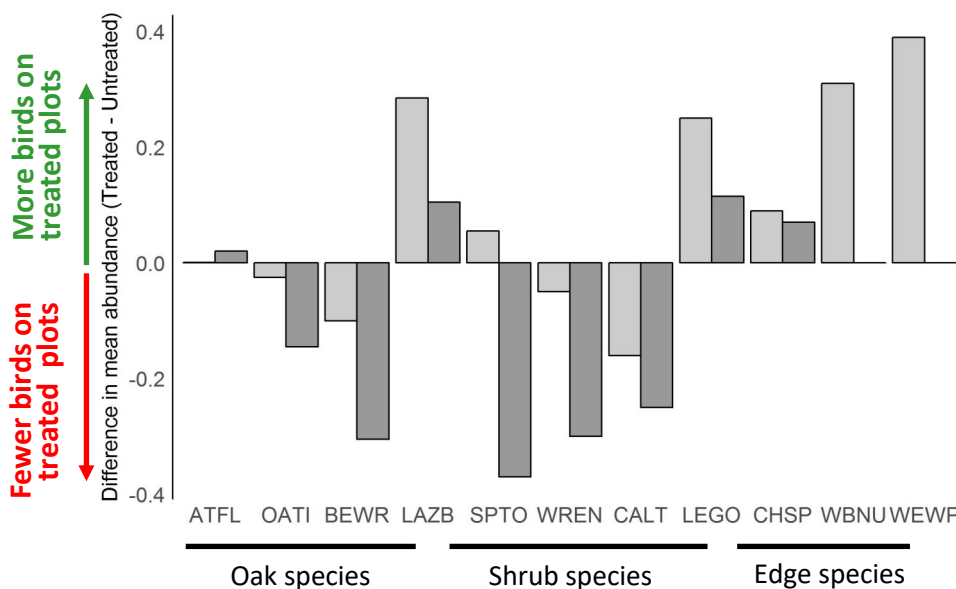
## Does it matter how we reduce fuel loads in oak chaparral habitat?

Yes. In a case study, large-scale mechanical methods which remove large patches of shrubs with excavators (i.e., masticators) did not improve habitat for any oak-associated bird species and reduced

the presence of shrub-associated bird species.<sup>1</sup>

However, another study showed smaller, manual treatments (i.e., hand pile and burn) improved habitat for bird species that require more open edges, without negatively affecting the

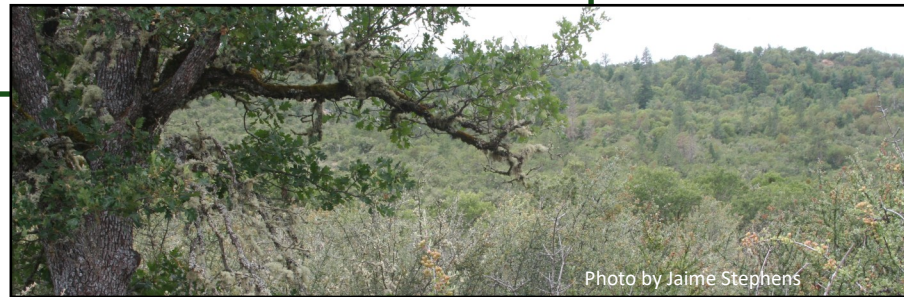
presence of shrub-associated birds.<sup>2</sup>



Species codes: Ash-throated Flycatcher (ATFL), Oak Titmouse (OATI), Bewick's Wren (BEWR), Lazuli Bunting (LAZB), Spotted Towhee (SPTO), Wrentit (WREN), California Towhee (CALT), Lesser Goldfinch (LEGO), Chipping Sparrow (CHSP), White-breasted Nuthatch (WBNU), Western Wood-Pewee (WEWP)

## A balancing act

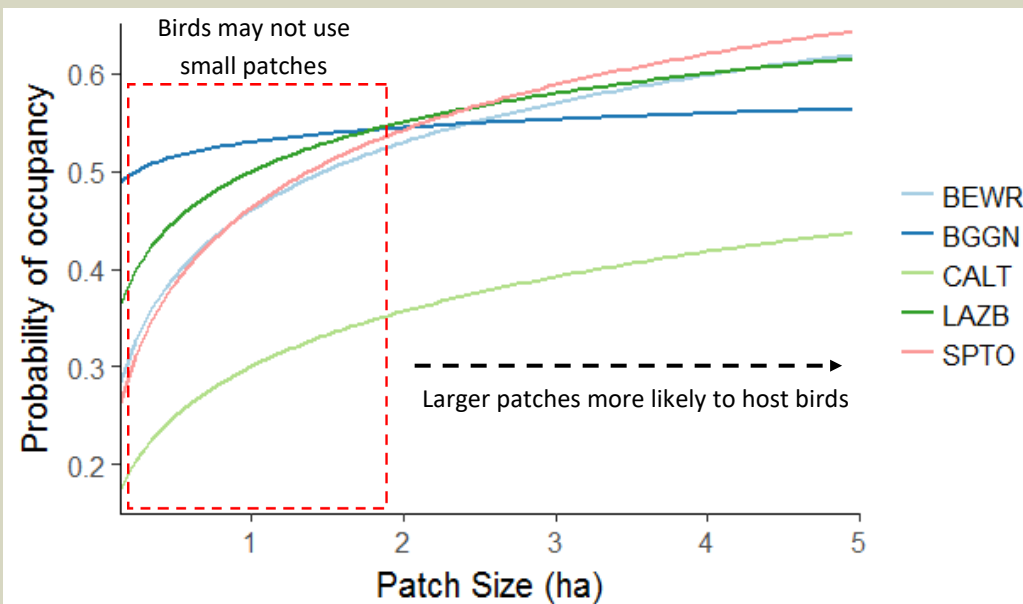
Oak habitats come in all shapes and sizes. Some have more dense stands of oak trees, some have more shrub and chaparral patches and understory in between trees, and others have more open space. Different bird species will settle in oak habitats depending on the type of vegetation that is available. One of the challenges for managers is designing restoration plans that will result in a balance of open grass, shrubs, and large oak trees so that each important habitat is represented.



## How large do chaparral patches need to be?

Not all chaparral is created equal. Very small patches of shrubs may not have enough of the shelter and resources birds need to settle and reproduce in oak and chaparral communities. We surveyed different

sizes of chaparral patches and found that larger patches were more likely to provide habitat for chaparral-associated birds. Small patches (less than 2 hectares) were more likely to host chaparral bird species if they were close to other patches.<sup>3</sup>



Species codes: Bewick's Wren (BEWR), Blue-gray Gnatcatcher (BGGN), California Towhee (CALT), Lazuli Bunting (LAZB), Spotted Towhee (SPTO)

## Did you know?

You can often tell the type of oak habitat you have on your land by noticing which species of birds are there. See our "Guide for Private Landowners" for details!

## Why the neighborhood matters

When it comes to habitat, location matters. A habitat patch that is otherwise the same size and quality may be more likely to host a bird species than another one, depending on the landscape surrounding the patch. Why?

### Habitat selection 101

Finding the perfect home isn't easy. Birds need habitat that satisfies several important needs—for example, an individual needs both food and protection from predators. Some species need cavities for nesting, others need shrubs or trees that provide canopy cover. But finding the perfect habitat can be challenging, so birds typically rely on 'cues' to narrow their search. Scientists have found that birds use coarse-scale cues to narrow down the general location where they expect to find what they are looking for (i.e., the neighborhood), and then settle into a smaller home within a larger area. Neighborhoods can also support bird populations by providing habitat for dispersal or adjacent habitat to move to with resources that they need at different times of the year.



Photo by Jaime Stephens



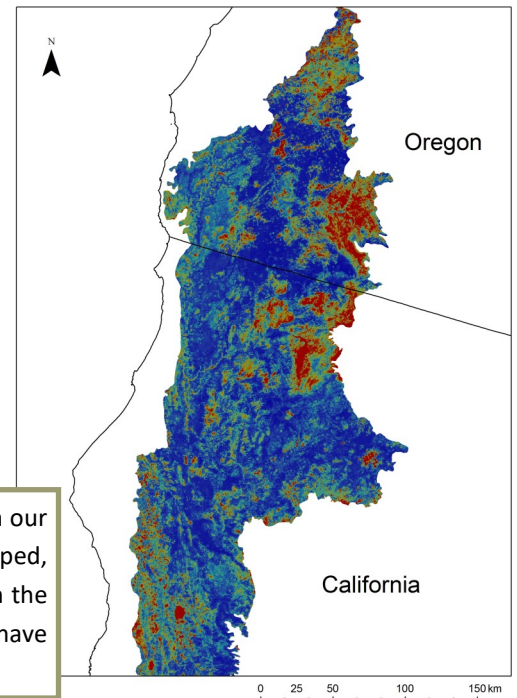
Photo ©James Livaudais

## A bird's eye view of habitat conservation

The neighborhood matters for conservation because "if you build it they will come" doesn't always apply— isolated habitat patches may not always attract birds if the habitat on the landscape is limited. So when we learn more about how bird species respond to habitat at landscape scales, we can better predict how local conservation or restoration actions may affect birds.

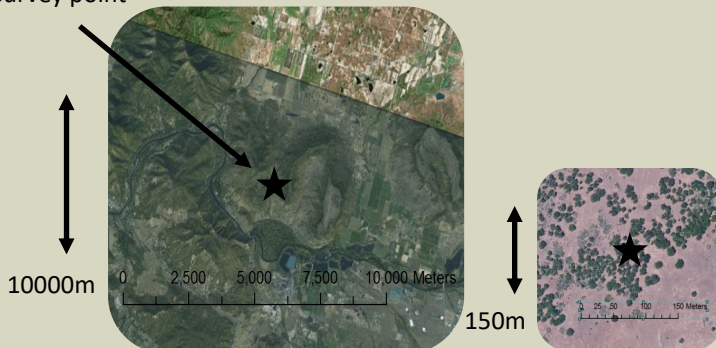
## Pictures taken from space can help us calculate 'habitat value'

Landsat images, taken from a satellite orbiting the earth and available online, provide values that correspond to how different types of light reflect off of the surface. The values are a good measure of vegetation that birds might see when they are selecting habitat. When we pair the values from Landsat images to bird survey data, we can develop an equation (a species distribution model) that is used to predict where we are mostly likely to find a bird species. By mapping bird distributions, we are letting the locations of the chaparral-associated birds tell us where the most chaparral habitat is. The so-called 'species-centered habitat value' can be mapped and allows us to examine the local and neighborhood characteristics that are most important for birds.

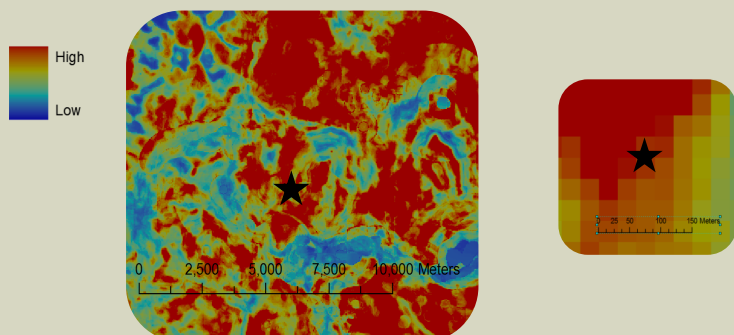


**A 'species-centered habitat value' map:** Habitat values from our models in the Klamath Mountains ecoregion can be mapped, showing us a range of probable chaparral habitat. Areas with the most habitat for chaparral birds are red, while areas that have the least chaparral habitat are blue.

Survey point



**Above:** What the landscape (left) and the local (right) scale looks like to us. **Below:** The calculated chaparral 'species-centered habitat value' from our models for the same areas.



## What the landscape means for chaparral-associated birds

Applying the 'species-centered habitat values', we found habitat amount at the landscape scale to be important for three of four chaparral associated bird species. Blue-gray Gnatcatcher and Bewick's Wren were more likely to be present at a survey point if there was a high amount of habitat available within 10km. California Towhee was more likely to be found at points with high chaparral habitat values within both 150m and 10km. For these species, restoration that retains adequate size patches of chaparral, at sites that are within landscapes with high amounts of habitat, are more likely to remain occupied following chaparral reduction.

# What You Can Do

- Restore a variety of oak woodland types and conditions to provide a diversity of habitats for different bird species
- Apply small-scale treatments like hand pile and burn rather than larger, mechanical treatments to achieve fuel reduction goals in oak-chaparral habitat
- Retain large (2-5+ hectare) patches of chaparral, and leave smaller patches nearby each other rather than separated by large distances
- When chaparral is removed retain and/or plant native perennial grasses
- Foster frequent, mixed low to moderate severity fire or maintain management practices that control non-native species
- To provide the greatest benefit to chaparral bird species, prioritize chaparral patch retention at sites where chaparral is common on the landscape within 10km



References: 1) Alexander, J.D., Seavy, N.E., Hosten, P., 2007. Using bird conservation plans to evaluate ecological effects of fuels reduction in southwest Oregon oak woodland and chaparral. *Forest Ecology and Management* 238: 375–383. 2) Seavy, N.E., Alexander, J.D. and Hosten, P.E., 2008. Bird community composition after mechanical mastication fuel treatments in southwest Oregon oak woodland and chaparral. *Forest Ecology and Management* 256:774-778. 3) Stephens and Gillespie (*in prep*) Chaparral patch size and nearby chaparral amount influence songbird occupancy.

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