
Bringing the Birds Back

*A Guide to Habitat Enhancement for Birds
in the Sacramento Valley*



A project of California Partners in Flight and PRBO Conservation Science





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Bird and habitat illustrations by Andy Birch

Common Yellowthroat
(Geothlypis trichas)

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Black-headed Grosbeak (*Pheucticus melanocephalus*)

For additional copies of this guide, please contact PRBO Conservation Science at (707) 781-2555 or visit the California Partners in Flight web site at www.prbo.org/calpif.

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Introduction

This easy-to-use guide to habitat restoration and enhancement describes practical steps that landowners and land managers can take to improve bird habitat – and thereby overall ecosystem health. This guide is focused on the Sacramento Valley Region, including the counties of Sacramento, Solano, Yolo, Placer, Sutter, Yuba, Colusa, Butte, Glenn, Tehama, and Shasta (Figure 1).

The guide begins with some background information about riparian (streamside) habitat and its importance for birds and other wildlife. It goes on to provide specific recommendations to benefit birds in this habitat. Finally, the guide includes information about agencies and organizations that can help with technical and financial assistance in habitat enhancement.

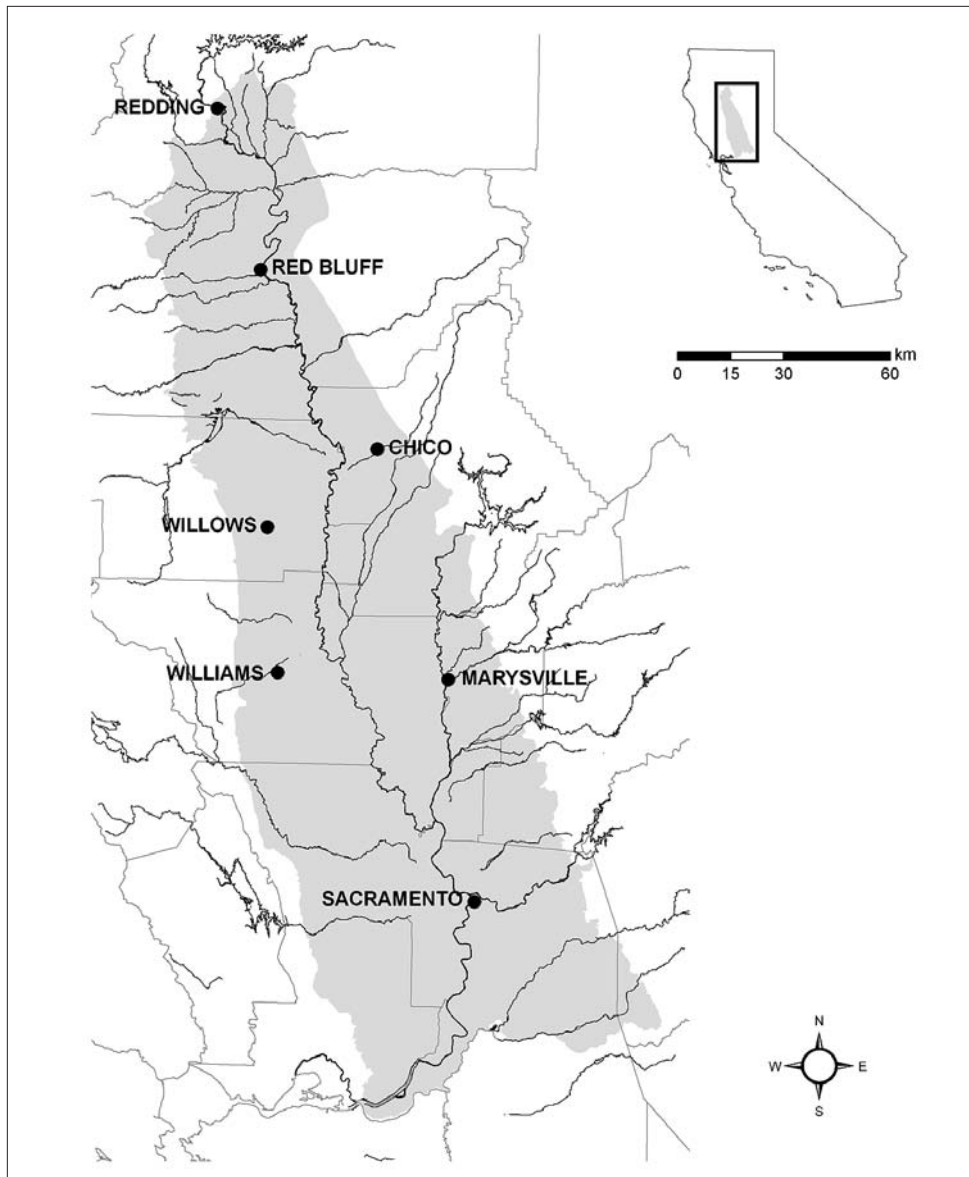


Figure 1. Sacramento Valley region (shaded) covered in the guide. The Sacramento River and its major tributaries are in black.



What is Riparian Habitat?

This guide is focused on riparian habitat because of its importance to wildlife, its need for preservation, the goods and services it supplies, and its high rate of occurrence on private lands in the Sacramento Valley. In general, riparian habitats are the vegetated areas that border the banks of rivers, streams, lakes, or other bodies of water. In the Sacramento Valley, riparian habitats often appear as lush forested woodlands along levees and floodplains of the Sacramento River and its tributaries. Riparian habitat also represents the transitional zone between upland and aquatic habitats and can support plants and animals from both. The presence of water promotes a diversity and abundance of native trees, shrubs, and grasses, and as a result, can support a diverse and abundant population of birds and other wildlife not otherwise seen in adjacent habitat types.

Riparian birds use every part of the habitat – some prefer the canopy for nesting and foraging while others specialize on shrubs or the ground. A healthy riparian habitat therefore contains a mixture of plant species, sizes, shapes, and ages. A mature riparian forest has a low layer of groundcover (understory), an intermediate layer of shrubs and small trees (midstory), and a high canopy of trees and vines (Figure 2). This “layering effect” provides an assortment of feeding and nesting locations for a variety of birds and other wildlife. Thus, a healthy riparian habitat should have high wildlife diversity and abundance.^{1,2}

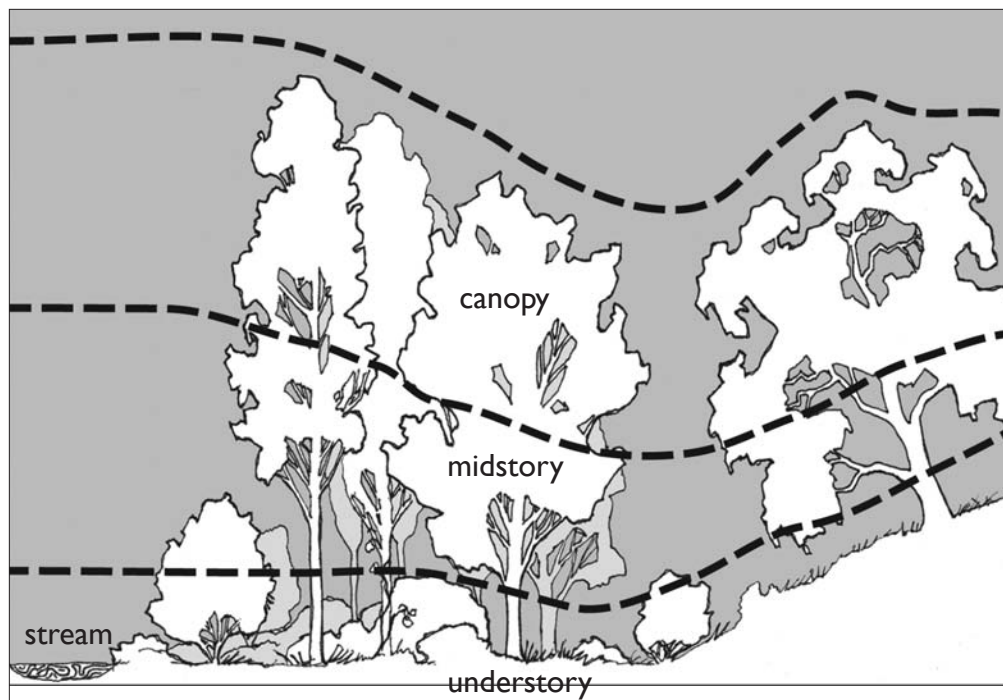


Figure 2. Healthy riparian habitat contains a mixture of layers with different plant species, sizes, shapes, and ages, as well as an unbroken transition to upland habitat.

Understory = the underlying layer of vegetation

Midstory = the intermediate layer of shrubs and small trees

Canopy = the uppermost layer in a woodland, formed by the crowns of trees



Why Enhance Riparian Habitat?

In California, riparian habitat converges with a variety of different land uses. For example, riparian habitat in the Sacramento Valley is often located adjacent to orchards, rice fields, vineyards, grazed pasture, small family farms, and/or urban areas. This convergence presents the challenge of how to maintain healthy riparian habitat while at the same time providing people with food, jobs, and homes. Why should landowners care about the preservation of riparian habitat? Healthy riparian habitat is important for both wildlife and people; together, all these elements contribute to the quality of life for one another.

Wildlife Habitat. In the Sacramento Valley, riparian habitat is the most productive and valuable habitat for all forms of wildlife. It is also one of the most threatened habitats, with only about 5% of the original riparian habitat remaining.³ Riparian habitat is important for numerous bird species because of the water, food, nesting sites, stopover sites during migration, and wintering sites that it provides. Riparian habitat that supports healthy bird populations will also support other wildlife. Riparian vegetation shades streams and maintains cooler water temperatures necessary for fish and other aquatic life.

Increase Property Values. Riparian habitats contribute to an aesthetically pleasing landscape that can increase the value of a property.

Improve Water and Air Quality. Riparian habitat can help stabilize soil, which improves water quality by preventing sediments from entering waterways. It can also improve water quality by filtering pollutants from rain water runoff, which reduces costs associated with water quality and fisheries protection.⁴ Trees improve air quality by absorbing toxins from the air. Furthermore, trees increase the amount of shade and can thereby decrease local air temperatures. This is particularly beneficial in the Sacramento Valley, where summertime temperatures exceed 100°F.

Carbon Capture. Trees and other plant species can play an important role in capturing and storing carbon, thereby reducing greenhouse gas and its contribution to global warming.

Can Reduce Pests. Many species of plants and animals found in riparian habitat help reduce pests.⁵ Birds in particular play an important role in control of forest and agricultural pests. American Kestrels, owls, and other raptors help to control the rodent population. A large hawk or owl can eat over a thousand mice and voles per year!⁶ Other birds such as flycatchers, wrens, and swallows reduce populations of pest insects, thus reducing the need for costly chemical sprays.

Bank Stabilization. Healthy riparian habitat helps to absorb water runoff and slow water velocity. Roots hold bank soil together, thereby stabilizing streambanks and reducing erosion.⁴



Using Birds to Guide Your Habitat Enhancement Project

Birds are the most familiar and widely enjoyed wildlife in North America. From predators to prey, and from pollinators to dispersers of seeds, the important functions of birds in our environment cannot be overstated.⁷ Despite their importance, some bird populations have shown drastic declines. There are many causes for these declines, but loss of appropriate habitat is often the primary reason. How do you know if you are creating appropriate habitat conditions with your enhancement projects?

Habitats that contain a variety of plant species, sizes, shapes and ages will be attractive to more bird species. For instance, species such as the Acorn Woodpecker require large oak trees with both live and dead branches for nesting cavities. Bird species such as the Song Sparrow and the California Quail require understory vegetation (Figure 2). A healthy and diverse understory with lots of groundcover offers well-concealed nest and feeding sites.

Birds as Indicators

Birds can serve as excellent indicators of habitat quality and condition. Birds are much more easily observed than other types of wildlife because they are generally active during the day, visually conspicuous, and highly vocal. Additionally, birds respond quickly to changes in their environment, which include enhancement projects like habitat restoration (Figure 3). In riparian habitat, different bird species rely on different habitat features – e.g., certain species nest in shrubs close to the ground, while others will nest at the tops of trees. You can therefore measure the progress of habitat enhancement projects by observing changes in the local bird community over time.



Common Yellowthroat
(*Geothlypis trichas*)

Figure 3. The number of birds increases as the age of restoration projects increases. Data collected from riparian restoration sites along the Sacramento River.⁸



How to Provide Quality Bird Habitat

Habitat enhancement and bird-friendly land management can stop population declines and contribute to the recovery of bird populations. Because birds use a variety of habitat features, there are many ways landowners can enhance bird habitat on their properties. Generally, the more habitat features your property has, the better it will be for birds.⁹

Here are suggestions to maintain and improve riparian habitat on your property and how to create new habitat to support a diverse bird community. These recommendations are supported by the most recent scientific information available on birds' needs. Landowners and land managers can contact their local Natural Resources Conservation Service (NRCS) field office or county Resource Conservation District (RCD) to obtain free assistance in planning and implementing these recommendations. Local NRCS field offices can also assist land managers in evaluating other opportunities for habitat improvements that may exist on a given property. NRCS and RCD field office locations and contact information are listed in Appendices A and B.

Recommendations

Minimize pesticide use. Landowners can help bird populations by avoiding landscaping methods that require the use of pesticides. Allow insect-eating birds to consume insect pests or use other alternatives to pesticides on working farms and ranches adjacent to riparian woodlands. This prevents damage to nesting birds and increases available feeding sites. See the Resources page for ideas on pesticide alternatives.

Consider the timing of your activities. The nesting season is a critical period in birds' lives. Disturbances during the breeding season may result in nest abandonment, the elimination of nest sites, destroying nests, exposing nests to predators, and decreasing food sources such as insects. Birds in the Sacramento Valley nest from March through August (Figure 4). Habitat enhancement and management activities, such as grazing, disking, herbicide application, and mowing should therefore be limited to the non-breeding season (September – February).

If you have to mow, mow early and often. Many songbirds nest very close to the ground in grasses and 'weedy' areas. If you have to mow, mow early (beginning in February) and often, as this will prevent birds from nesting where you wish to mow. Do not mow native tree saplings and shrubs. Even poison oak, a native shrub, has high value for birds and other wildlife.

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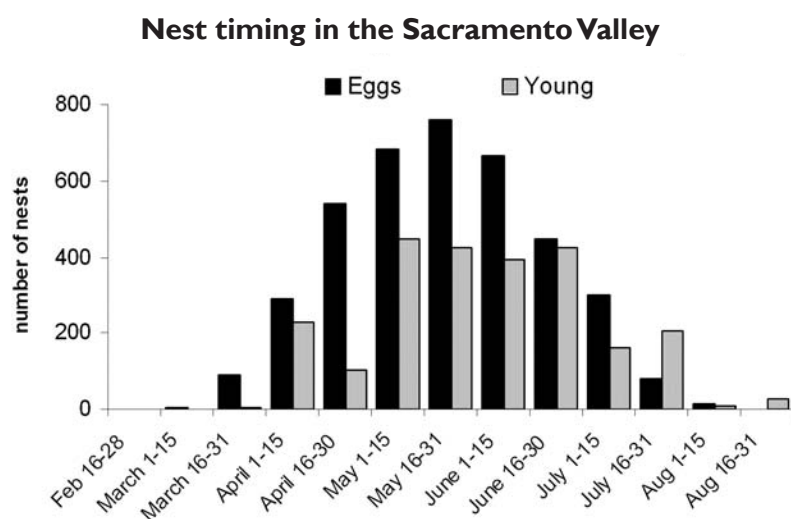


Figure 4. Timing of the breeding season for birds in the Sacramento Valley. Data are total number of nests by first egg and hatching dates from 61 species, 1993 – 2005.

Recommendations, *continued*

Encourage native cavity nesting birds. Numerous bird species nest in cavities, including rodent-eating Barn Owls and Kestrels, and insect-eating Western Bluebirds and Tree Swallows. Unfortunately, many native cavity nesting birds have undergone steep population declines due to a short supply of natural cavities combined with competition from introduced cavity nesters such as the European Starling. A few important steps you can take that will benefit cavity nesting birds on your land include:

- Retain snags and woody material. Decaying trees and limbs provide nesting and food storage sites for cavity nesting birds. Allowing dead limbs to remain on living trees and retaining dead trees will allow birds to excavate cavities in rotting wood. Try to leave dead trees standing whenever possible.

- Set up nest boxes. The use of nest boxes can greatly increase the number of native cavity nesters on your land when done properly. Specific information about setting up nest boxes, including box design and placement guidelines can be found at www.prbo.org/calpif/enhancement.html and <http://www.birds.cornell.edu/birdhouse>.

Manage non-native animal species. Non-native birds may compete with native birds for nest cavities. In California, introduced Wild Turkeys are emerging as a concern because they eat large amounts of acorns, which may impact oak regeneration; they disturb soil, which may increase the spread of non-native plants; and they are known to be aggressive toward humans and damage crops such as wine grapes. Other non-native animals, such as domestic cats, kill millions of birds every year.^{10, 11}

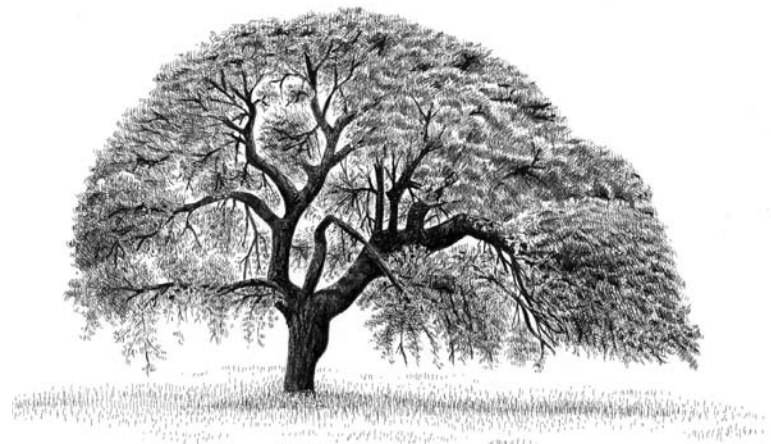
- To reduce the effects of non-native animals on native birds:

- ◆ Do not feed or otherwise encourage populations of non-native animals.

- ◆ Keep cats indoors.
- ◆ Do not put bird feeders in a yard where a cat might ambush feeding birds.
- ◆ Eliminate sources of food such as open garbage cans, open compost piles, or outdoor pet food dishes that attract and increase the number of stray cats or other predators.

Restore riparian corridor width. Riparian corridors today are much narrower than they were historically, especially in the Sacramento Valley.³ There is no specific minimum width for riparian corridors that will provide fish and wildlife habitat. Generally speaking, however, wider riparian corridors provide better habitat for more species than narrower riparian corridors. The effect of riparian corridor width varies by bird species and riparian type. In general, a width of at least 100 meters (approximately 330 feet) is considered optimal for creating quality riparian habitat, though narrower corridors are still beneficial for wildlife movement and dispersal.²

Connect habitat patches with corridors. A corridor is a continuous area of similar vegetation, usually defined by the dominant vegetation. Corridors create habitat connectivity, which allow wildlife to move and disperse between isolated habitat patches. Design corridors to connect habitat patches on your property or adjacent neighbors' properties. Even narrow strips can be used as travel corridors by bird species such as Spotted Towhee and Song Sparrow.



Focus habitat restoration projects near existing riparian habitat patches. Mature riparian patches often act as the source of birds for newly restored riparian patches. PRBO's work in the Sacramento Valley indicates that the greater the amount of riparian habitat near a restoration site results in a greater abundance of birds. Therefore, you will have more birds moving into a restored site the closer that site is located to existing riparian habitat patches.

Diversify and enhance surrounding habitats. Preserve and restore the transitional and upland habitats adjacent to riparian corridors. In the Sacramento Valley landscape, this may include wetlands, oxbow lakes, scrubby willows, oak woodlands, oak savannah, and grasslands. Birds are not confined to any one habitat type, and species that regularly nest in riparian may use adjacent habitats for foraging.¹²

Provide brushpiles for cover. A brushpile can provide cover from predators, loafing cover, nesting location, and protection from inclement weather. Consider creating brushpiles that are: 1) large and tall (at least 3 feet); 2) close to existing cover, such as a blackberry bush; and 3) contain primarily branches, limbs, and few logs.¹³

Plant native plants. Plant native grasses, shrubs, and trees that are adapted to local conditions (Table 1). Observe the nearby native vegetation to identify what species to plant and refer to Table 1 for local native plant species important to birds. *Note: Some plant species will be more appropriate than others depending on the site conditions and specific location within the Sacramento Valley.* Focus on increasing the number and diversity of fruiting plant species (e.g., California grape, blue elderberry and California blackberry) as these are essential food resources to birds.

Plant with local plant stocks. Use plant material (seeds, cuttings, divisions, etc.) derived from a local source as much as possible, preferably from adjacent riparian areas if not from within the same floodplain or watershed. Planting with locally derived plant stocks is important for maintaining the natural

genetic diversity of plants in the Sacramento Valley. Furthermore, using local plant stocks ensures greater success with restoration projects, because local plant stocks are best adapted to site-specific conditions (e.g., soil pH).

Plant a diversity of plant species. A high plant diversity in riparian woodlands attracts many different types of birds (Figure 5). Greater diversity of plant species = greater diversity of birds! The number of tree species planted is especially important for enhancing the number of birds in the Sacramento Valley.

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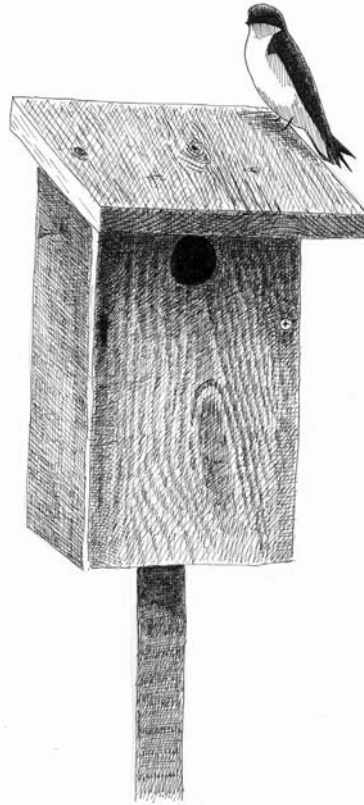


Habitat diversity = bird abundance.

Recommendations, *continued*

Promote diverse vegetation structure. A diversity of plant species, ages, shapes, and sizes will provide more nesting and feeding sites for a greater variety of birds (Figure 5). Also, the greater number of potential nest sites, the greater the effort required for predators to locate prey (nest sites), and thus the safer the birds.

Remove non-native vegetation. Non-native vegetation can out-compete and hinder the establishment of native plant species, thereby reducing vegetation structure. Invasive non-native plants often spread very quickly and should be removed at the first sign of their presence (Table 2). Removal of invasive non-native vegetation will facilitate growth of native vegetation and subsequently provide more riparian habitat for birds. Effective removal of well established non-native vegetation often requires manual and/or mechanical removal combined with chemical treatment; the timing of these activities can be important to successfully eradicating some species. Furthermore, effectiveness of non-native plant control efforts can be greatly enhanced by, or may require, the establishment of native plants in order



Tree Swallow (*Tachycineta bicolor*)
at nest box.

to reduce the possibility of reinvasion or invasion by other invasive species. Follow-up monitoring and maintenance of treated areas is also important to ensure the long-term success of your removal efforts. Consult with your local RCD or NRCS field office for information regarding management of non-native and invasive plant species in your project. General guidelines on how to remove the non-native plants listed in Table 2 can be found at www.prbo.org/calpif/enhancement.html.

Develop a plan. Landowners can improve the long-term success of their efforts by developing a strategy for implementing habitat improvements. Depending on the scope and area of the project, planning may range from simply planting and watering some willow cuttings to implementing a suite of management practices to improve the overall condition of riparian habitat. In some instances, well thought-out action can mean the difference between success and frustration. Free technical assistance for planning, acquiring permits, and implementing riparian habitat enhancements can be obtained by contacting your local NRCS or RCD field office (Appendices A – B).

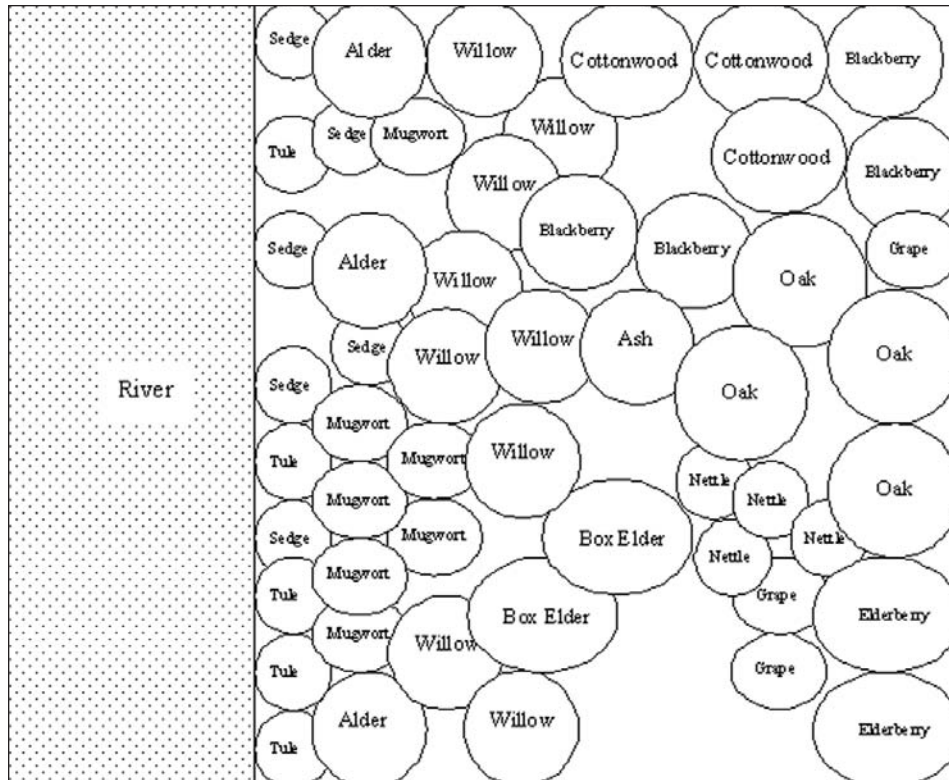
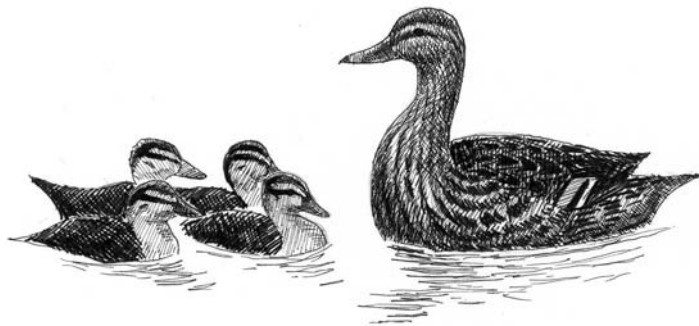


Figure 5. A simplified schematic planting design near a stream showing:

- (1) multiple species plantings;
- (2) locations for plant species needs;
- (3) clumped design with interspersed trees, understory plants and clearings.

Plant a variety of plant species to provide a diverse vegetation structure.

Greater diversity of plant species = greater diversity of birds.



Mallards (*Anas platyrhynchos*)



Healthy riparian woodlands are important for wildlife and people and together contribute to the quality land in the Sacramento Valley. Riparian woodlands provide quality nesting habitat for many bird species, Nest boxes provide additional nest sites for cavity nesters such as the Tree Swallow, whereas large valley such as the Swainson's Hawk and Yellow-billed Magpie.



of life for all. Here is a healthy working landscape with riparian woodlands maintained alongside farm- including the Song Sparrow, Common Yellowthroat, Black-headed Grosbeak and Nuttall's Woodpecker. oak trees adjacent to the riparian corridor provide perching and nesting sites for open-country birds,

Table 1. Recommended native riparian plants found the Sacramento Valley region. *Note: Some plant species may be more appropriate than others depending on your particular area. Contact your local NRCS field office or RCD for information regarding native plants appropriate for your project. Find a local model for your project.*

Plant Species	Notes
<i>Trees: canopy and midstory</i>	
alder, white <i>Alnus rhombifolia</i>	Full sun. Stabilizer-good for restoring degraded areas. Streamside edges.
ash, Oregon <i>Fraxinus latifolia</i>	Found in canyons, streambanks, woodlands.
cottonwood, Fremont <i>Populus fremontii</i>	Alluvial bottomlands, sandy soils, streamside. Easily started from cuttings.
elder, box <i>Acer negundo</i>	Stabilizer-good for restoring degraded areas. Found along streamside.
oak, valley <i>Quercus lobata</i>	Full sun, deep soils. Found on slopes, valleys, savannahs.
sycamore, western <i>Platanus racemosa</i>	Full sun, well drained soils. Found in canyons, streamside.
willow, arroyo <i>Salix lasiolepis</i>	Full sun and well drained soils. Stabilizer-good for restoring degraded areas. Easily started from cuttings.
willow, Gooding's black <i>Salix goodingii</i>	Very tolerant of wet, anaerobic, clay soils. Found along streams, washes, and meadows. Easily started from cuttings.
willow, sandbar <i>Salix exigua</i>	Full sun. Can grow in sand and tolerates anaerobic soils. Easily started from cuttings.
willow, shiny <i>Salix lucida</i>	Prefers wet areas along rivers with sandy soils and moving water. Easily started from cuttings.
willow, red <i>Salix laevigata</i>	Full sun, moist places. Good streamside stabilizer. Common along ephemeral streams.
<i>Shrubs: midstory and understory</i>	
blackberry, California <i>Rubus ursinus</i>	Found in moist places, streamside. Stabilizer-good for restoring degraded areas. Easily started from divisions.
buttonbush <i>Cephalanthus occidentalis</i>	Full sun, marshland and very wet places.
coffeeberry, hoary <i>Rhamnus tomentella</i>	Needs excellent drainage; intolerant of frequent watering, tolerant of deer browsing.
coyote brush <i>Baccharis pilularis</i>	Full sun. Good for restoring degraded areas. Deer and drought tolerant. Does not tolerate flooding for more than a few days.
dogwood, red osier <i>Cornus sericea</i>	Generally found in moist places. Easily started from cuttings.
elderberry, blue <i>Sambucus mexicana</i>	Found in forest openings, streambanks. Prefers deep soils. Easily started from cuttings.
mulefat <i>Baccharis salicifolia</i>	Does well in sandy soils, moist streamside. Easily started from cuttings.
redbud, western <i>Cercis occidentalis</i>	Full sun, generally moist places and well drained soils.
wild rose, california <i>Rosa californica</i>	Full sun. Stabilizer-good for restoring degraded areas. Easily started from divisions.

Table I continued

<i>Vines: midstory and understory</i>	
pipevine, California <i>Aristolochia californica</i>	Creeping and climbing vine. Great for attracting butterflies.
virgin's bower <i>Clematis ligusticifolia</i>	Tree-climbing vine. Shade or sun, creeping and climbing vine, moist stream-sides.
wild grape, California <i>Vitis californica</i>	Shade or sun. Tree-climbing vine or groundcover. Found along moist stream-sides. Easily started from cuttings.
<i>Grasses and Forbs: understory</i>	
barley, California <i>Hordeum brachyantherum</i>	Full sun to partial shade in moist conditions.
deergass <i>Muhlenbergia rigens</i>	Thick, clumping grass. Several other species of <i>Muhlenbergia</i> may be found throughout the state, primarily in wet conditions. Easily planted by plugs over smaller areas.
goldenrod, California <i>Solidago californica</i>	Full sun. Excellent for weed suppression.
milkweed, narrow-leaved <i>Asclepias fascicularis</i>	Good for attracting Monarch Butterflies.
mugwort <i>Artemisia douglasiana</i>	Stabilizer-good for restoring degraded areas. Found in open to shady places. Good habitat structure. Broadcast seeds on bare soil.
nettle, stinging <i>Urtica dioica</i>	Found in moist places, stream banks. Good habitat structure. Broadcast seeds on bare soil. Food for Satyr Coma butterfly.
sedge, clustered-field <i>Carex praegracilis</i>	Full to nearly full sun, edge of sloughs, and flood basins. Easily started from divisions.
sedge, Santa Barbara <i>Carex barabarae</i>	Full sun, generally moist areas. Easily started from divisions.
tule, hard-stemmed <i>Scirpus acutus</i>	Full sun, wet areas. Easily started from divisions.
wildrye, creeping <i>Leymus triticoides</i>	Full sun or nearly full shade. Found along margins of sloughs and flood basins. Excellent ground cover. Easily started from divisions.
wildrye, blue <i>Elymus glaucus</i>	Relatively widespread native bunchgrass tolerant of relatively wet to dry conditions. Generally sunnier conditions. Easily planted by plugs over smaller areas
wildrye, slender <i>Elymus trachycaulis</i>	Found along margins of sloughs and flood basins and adjacent uplands. Excellent ground cover. Full sun or nearly full shade.

Table 2. Examples of invasive non-native plants of the Sacramento Valley. To learn about specific removal methods, visit www.prbo.org/calpif/enhancement.html. Also, contact your local NRCS field office or RCD for information regarding management of non-native and invasive plant species in your project.

Examples of Invasive Non-native Plants		
blackberry, Himalayan <i>Rubus discolor</i>	cedar, salt <i>Tamarisk parviflora</i>	eucalyptus <i>Eucalyptus sp.</i>
fig, edible <i>Ficus carica</i>	hemlock, poison <i>Conium maculatum</i>	ivy <i>Hedera sp.</i>
johnsongrass <i>Sorghum halepense</i>	locust, black <i>Robinia pseudoacacia</i>	mustard, wild <i>Brassica sp.</i>
pepperweed, perennial <i>Lepidium latifolium</i>	periwinkle <i>Vinca major</i>	reed, giant <i>Arundo donax</i>
thistle, bull <i>Cirsium vulgare</i>	thistle, yellow star <i>Centaurea solstitialis</i>	tree-of-heaven <i>Ailanthus altissima</i>



Black-headed Grosbeak (*Pheucticus melanocephalus*)



Tracking Your Progress

Every financial investment needs to be reviewed periodically to ensure successful gains. The same is true when investing in wildlife habitat. It is important to track the progress of your habitat enhancement projects. A diverse bird community indicates that your enhancement efforts are working!

Observe the birds on your property to help determine the success of your efforts. Keep notes through time, and note changes as habitat restorations mature.

Here are a few of suggestions for tracking the progress of your enhancement project:

- Use the bird list on Table 3 to help you determine which bird species visit your property.
- Watch for signs of nesting: carrying food or nesting material, adults feeding young outside of the nest.
- If you have a nest box, monitor the contents. More information on nest box monitoring can be found at: <http://www.birds.cornell.edu/birdhouse>
- Take photographs to document changes in your project over time.
- Formal scientific monitoring techniques can be found through PRBO Conservation Science (www.prbo.org).

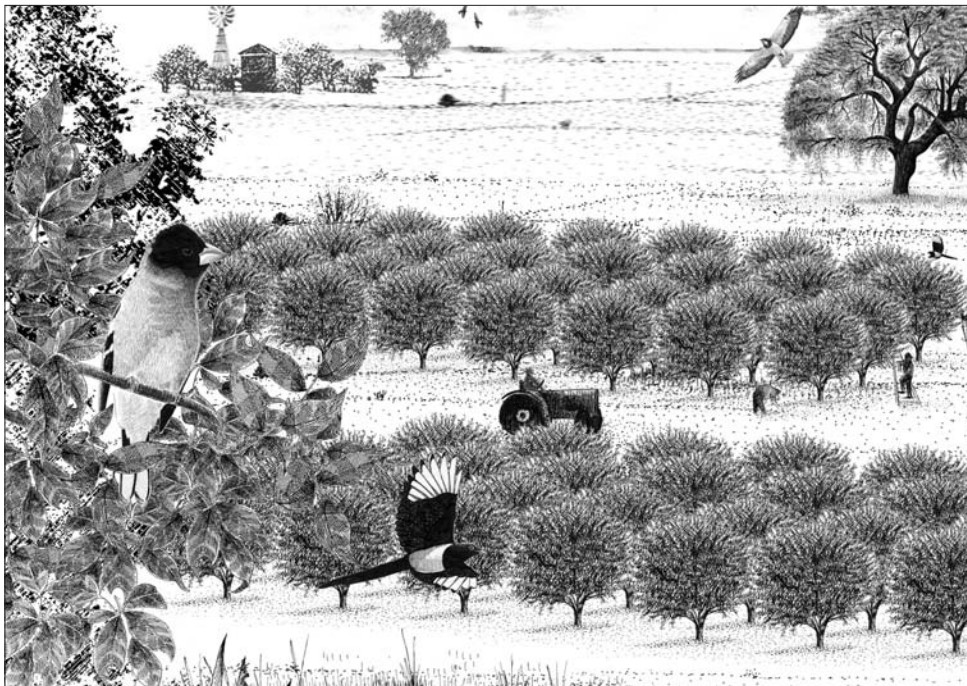


Table 3. Common riparian bird species of the Sacramento Valley listed in alphabetical order.

Species	Scientific Name	Season	Nesting Location
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	Year round	Cavity
American Goldfinch	<i>Carduelis tristis</i>	Year round	Midstory, undersory
American Kestrel	<i>Falco sparverius</i>	Year round	Cavity
American Robin	<i>Turdus migratorius</i>	Year round	Midstory
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Summer	Cavity
Bewick's Wren	<i>Thryomanes bewickii</i>	Year round	Cavity
Black Phoebe	<i>Sayornis nigricans</i>	Year round	Under bridges, ledges
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Summer	Midstory
Blue Grosbeak	<i>Guiraca caerulea</i>	Summer	Understory
Bullock's Oriole	<i>Icterus bullockii</i>	Summer	Canopy, midstory
Bushtit	<i>Psaltriparus minimus</i>	Year round	Midstory
California Towhee	<i>Pipilo crissalis</i>	Year round	Understory
Common Yellowthroat	<i>Geothlypis trichas</i>	Year round	Understory
Downy Woodpecker	<i>Picoides villosus</i>	Year round	Cavity
Hermit Thrush*	<i>Catharus guttatus</i>	Winter	
House Wren	<i>Troglodytes aedon</i>	Summer	Cavity
Hutton's Vireo	<i>Vireo huttoni</i>	Year round	Midstory
Lazuli Bunting	<i>Passerina amoena</i>	Summer	Understory
Nuttall's Woodpecker	<i>Picoides nuttallii</i>	Year round	Cavity
Oak Titmouse	<i>Baeosolophus inornatus</i>	Year round	Cavity
Osprey	<i>Pandion haliaetus</i>	Year round	Canopy
Red-shouldered Hawk	<i>Buteo lineatus</i>	Year round	Canopy
Ruby-crowned Kinglet*	<i>Regulus calendula</i>	Winter	
Song Sparrow	<i>Melospiza melodia</i>	Year round	Understory
Spotted Towhee	<i>Pipilo maculatus</i>	Year round	Understory
Swainson's Hawk	<i>Buteo swainsoni</i>	Summer	Canopy
Tree Swallow	<i>Tachycineta bicolor</i>	Summer	Cavity
Western Bluebird	<i>Sialia mexicana</i>	Summer	Cavity
Western Scrub-Jay	<i>Aphelocoma coerulescens</i>	Year round	Midstory
Western Wood-pewee	<i>Contopus sordidulus</i>	Summer	Midstory
Wrentit	<i>Chamaea fasciata</i>	Year round	Understory
Yellow-breasted Chat	<i>Icteria virens</i>	Summer	Understory
Yellow Warbler	<i>Dendroica petechia</i>	Sumer	Midstory

* winter only



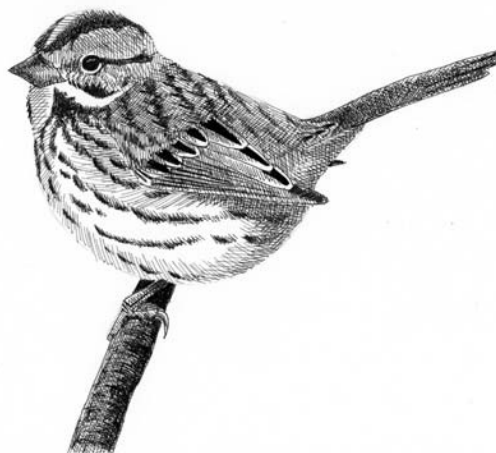
About PRBO Conservation Science and California Partners in Flight

This guide is a collaborative effort of PRBO Conservation Science and California Partners in Flight. Founded in 1965 as the Point Reyes Bird Observatory, PRBO Conservation Science (PRBO) is dedicated to conserving birds, other wildlife and ecosystems through innovative scientific research and effective outreach. Working throughout the West, our 120 staff scientists and seasonal biologists study birds and ecosystems to protect and enhance biodiversity. We work with governmental, non-profit and private landowner partners to ensure that sound science is guiding conservation efforts and management practices. For more information, visit: <http://www.prbo.org>. California Partners in Flight (CalPIF) is the state-wide chapter of an international working group dedicated to conserving bird populations and their habitats throughout the western hemisphere. CalPIF was established in 1992 in response to growing concerns about declines in populations of landbird species across California. As a coalition of public and private agencies, CalPIF identifies conservation and management priorities for landbird species in California. For more information, visit: <http://www.prbo.org/calpif>.

Building on our songbird research in riparian habitats in California, PRBO and CalPIF are developing strategies for protecting and managing riparian habitats and their associated birds. This information is summarized in The Riparian Bird Conservation Plan (available at www.prbo.org/calpif). This plan provides science-based, hands-on management recommendations for biologists and habitat managers throughout the state of California.

Acknowledgements

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Song Sparrow (*Melospiza melodia*)



Additional Resources for Landowners and Managers

The USDA Natural Resources Conservation Service (NRCS) is the primary federal agency responsible for assisting voluntary conservation of natural resources on privately owned lands. NRCS provides free technical and planning assistance to owners and managers of private lands through their Conservation Technical Assistance Program (<http://www.nrcs.usda.gov/programs/cta/>). NRCS also offers numerous incentive programs for agricultural producers to create and enhance habitat on private land. Programs that incorporate riparian habitat include Wetlands Reserve Program (WRP), Conservation Reserve Program (CRP), and Environmental Quality Incentives Program (EQIP). The Wildlife Habitat Incentive Program (WHIP) provides support to private landowners for wildlife habitat development. For more information on these programs and California NRCS, visit: <http://www.ca.nrcs.usda.gov>. Addresses and phone numbers of local Sacramento Valley NRCS offices are listed in Appendix A.

Resource Conservation Districts (RCD) are non-regulatory local special districts established throughout California to provide conservation information to local agricultural and other landowners. They are governed by an appointed or elected board of local landowners. Addresses and phone numbers of Sacramento Valley RCD offices can be found in Appendix B.

The University of California Cooperative Extension (UCCE) is a research and education branch of the University of California. Advisors are available in county offices with expertise in wildlife, range management, environmental horticulture and watershed management. Addresses and phone numbers of local Sacramento Valley UCCE offices can be found in Appendix C.

The U.S. Fish and Wildlife Service (USFWS) supports voluntary restoration of fish and wildlife habitats on private land through the Partners for Fish and Wildlife Program (PFW). For more information on this program, visit: <http://www.fws.gov/partners/index.htm>

California Department of Fish and Game administers the Landowner Incentive Program (LIP), which supports on-the-ground projects that enhance, protect, or restore habitats that benefit “species-at-risk” on privately owned lands. For more information, visit: <http://www.dfg.ca.gov/lands/lip/index.html>

State of California Wildlife Conservation Board (WCB) administers the California Riparian Habitat Conservation Program (CRHCP). The mission of this program is to develop coordinated conservation efforts aimed at protecting and restoring the state’s riparian ecosystems. The CRHCP is a cooperative effort involving state and federal agencies, local government, nonprofit conservation groups, private landowners, and concerned citizens. For more information, visit: <http://www.wcb.ca.gov>

River Partners is a nonprofit corporation founded by two ecologically minded farmers who believed that agriculture and habitat restoration could work together. Their mission is to create wildlife habitat for the benefit of people and the environment. They have been involved in numerous riparian restoration projects throughout the Sacramento Valley region. For more information visit: <http://www.riverpartners.org>

Wild Farm Alliance was established by a national group of wildlands proponents and ecological farming advocates who share a concern for the land and its wild and human inhabitants. For more information, visit: <http://www.wildfarmalliance.org>

Northwest Coalition for Alternatives to Pesticides works to protect people and the environment by advancing healthy solutions to pest problems. For more information, visit: <http://www.pesticide.org>

Calflora Database is a nonprofit organization dedicated to providing information about California plant biodiversity for use in education, research and conservation. It provides access to habitat descriptions, photographs, observations, nomenclature, distribution maps, and other data on California's wild plants. For more information, visit: <http://www.calflora.org>

The Jepson Interchange and Jepson Flora Project provides a wealth of information on California flora. Resources of the Flora Project are directly linked to the Consortium of California Herbaria, CalPhotos, the California Native Plant Society, California Exotic Pest Plant Council, USDA-Plants database, and many other external sites. For more information, visit: http://ucjeps.berkeley.edu/jepson_flora_project.html

California Native Plant Society seeks to increase understanding of California's native flora and to preserve this rich resource for future generations. For more information, visit: <http://www.cnps.org>

California Invasive Plant Council's mission is to protect California wildlands from invasive plants through restoration, research and education. For more information, visit: <http://www.cal-ipc.org>

The Audubon Society works to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity. For more information, visit: <http://www.audubon.org>

Audubon California maintains a Landowner Stewardship Program, which assists private landowners with conserving and restoring wildlife habitat on farms and ranches in a manner compatible with existing agricultural operations. For more information, visit: <http://ca.audubon.org>



Yellow-billed Magpie (*Pica nuttalli*)

Appendix A. USDA – Natural Resources Conservation Service (NRCS) field offices serving Sacramento Valley.
More information can be found online at <http://www.ca.nrcs.usda.gov>.

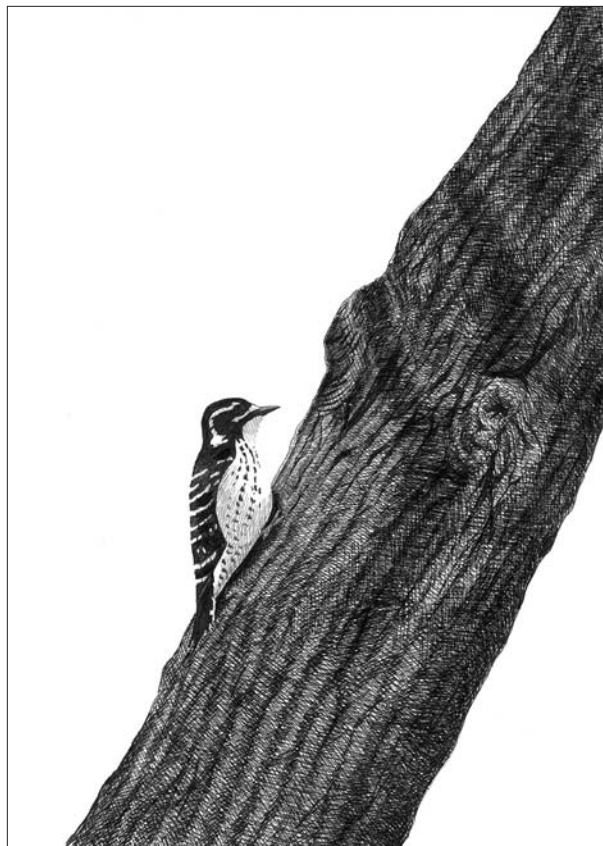
USDA NRCS State Office of California 430 G ST # 4164, Davis, CA 95616-4164 (530) 792-5600	Colusa Service Center 100 Sunrise Blvd. Suite B, Colusa, CA 95932-3246 (530) 458-5131
Dixon Service Center 1170 N Lincoln St, Dixon, CA 95620-4001 (707) 678-1931	Elk Grove Service Center 9701 Dino Dr. Suite 107, Elk Grove, CA 95624-4042 (916) 714-1104
Oroville Service Center 150 Chuck Yeager Way, Oroville, CA 95965-9215 (530) 534-0112 ext 2	Red Bluff Service Center 2 Sutter St. Suite C, Red Bluff, CA 96080-4353 (530) 527-3013
Redding Service Center 3644 Avtech Pkwy, Redding, CA 96002-9241 (530) 226-2560	Willows Service Center 132 N Enright Ave, Willows, CA 95988-2716 (530) 934-4601
Woodland Service Center 221 W Court St. Suite 3B, Woodland, CA 95695-2983 (530) 662-2037	Yuba City Service Center 1511 Butte House Rd. Suite B, Yuba City, CA 95993-2235 (530) 674-1461

Appendix B. Resource Conservation Districts (RCD) serving the Sacramento Valley.

Butte County RCD 150 Chuck Yeager Way, Suite A, Oroville, CA 95965 (530) 534-0112	Colusa County RCD 100 Sunrise Blvd. Suite B, Colusa, CA 95932 (530) 458-2932 x101
Dixon RCD (Solano and Yolo counties) 1170 N. Lincoln Suite 110, Dixon, CA 95620 (707) 678-1655 x105	Glenn County RCD 132 North Enright Suite B, Willows, CA 95988 (530) 934-8667
Lower Cosumnes RCD (Sacramento County) 9701 Dino Drive #3170, Elk Grove, CA 95624 (916) 485-9883	Placer County RCD 251 Auburn Ravine Rd. #201, Auburn, CA 95603 (530) 885-3046
Sloughhouse RCD (Sacramento County) 9701 Dino Dr. #170, Elk Grove, CA 95624 (916) 714-1104 x112	Sutter and Yuba County RCD 1511 B Butte House Road, Yuba City, CA 95993 (530) 674-1461
Tehama County RCD 2 Sutter Street #D, Red Bluff, CA 96080 (530) 527-3013	Vina RCD PO Box 274, Vina, CA 96092 (530) 839-2130
Western Shasta RCD 3294 Bechilli Lane, Redding, CA 96002 (530) 246-5299	Yolo County RCD 221 W. Court St. Suite 1, Woodland, CA 95695 (530) 662-2037

Appendix C. University of California Cooperative Extension (UCCE) offices serving the Sacramento Valley.

<p>UCCE-Butte 2279-B Del Oro Avenue, Oroville, CA 95965 (530) 538-7201</p>	<p>UCCE-Colusa PO Box 180, 100 Sunrise Blvd, Suite E, Colusa, CA 95932 (530) 458-0570</p>
<p>UCCE-Glen PO Box 697, 821 E. South Street, Orland, CA 95963 (530) 865-1107</p>	<p>UCCE-Placer 11477 E. Avenue, Auburn, CA 95603– (530) 889-7385</p>
<p>UCCE-Sacramento 4145 Branch Center Road, Sacramento, CA 95827-3898 (916) 875-6913</p>	<p>UCCE-Shasta 1851 Hartnell Avenue, Redding, CA 96002-2217 (530) 224-4900</p>
<p>UCCE-Solano 501 Texas Street, Fairfield, CA 94533-4498 (707) 784-1317</p>	<p>UCCE-Sutter/Yuba 142 Garden Highway, Suite A, Yuba City, CA 95991-5512 (530) 822-7515\</p>
<p>UCCE-Tehama 1754 Walnut Street, Red Bluff, CA 96080 (530) 527-3101</p>	<p>UCCE-Yolo 70 Cottonwood Street, Woodland, CA 95695 (530) 666-8143</p>



Nuttall’s Woodpecker (*Picoides nuttallii*)



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