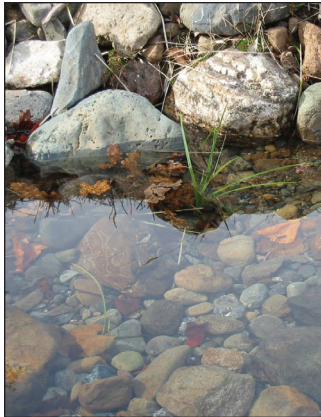




*stewardship Guide*  
*for the Russian River*



## ACKNOWLEDGEMENTS



The Sonoma Resource Conservation District (RCD) wishes to thank those who helped write and review the *Stewardship Guide for the Russian River*:

*Principal Contributors:* Kara Heckert and Greg Fisher, Sotoyome RCD; Maggie Young, Prunuske Chatham, Inc.; Lisa Hulette, Gold Ridge RCD

*Reviewers/Editors:* Jan Olave, Mendocino County RCD; Sierra Cantor, Sotoyome RCD; Dennis Murphy and Earle Cummings, Sotoyome RCD Board of Directors; Liza Prunuske, Prunuske Chatham, Inc.; Lisa Renton, Sonoma County Water Agency; and Derek Acomb, California Department of Fish and Game

*Graphic Design:* Kim Dow, DowHouse

*Additional copies of this guide are available from:*

Sonoma RCD, 1221 Farmers Lane, Suite F, Santa Rosa, CA 95405  
[www.sonomarcd.org](http://www.sonomarcd.org)

Gold Ridge RCD, 2776 Sullivan Road, Sebastopol, CA 95472  
[www.goldridgercd.org](http://www.goldridgercd.org)

Mendocino RCD, 410 Jones Steet, Suite C-3, Ukiah, CA 95482  
[www.mccrcd.org](http://www.mccrcd.org)

Special thanks to the Sonoma County Water Agency, Gold Ridge RCD, Mendocino County RCD, and the Mead Foundation for providing funding for the development and printing of this guide.

Additional thanks to Sonoma County Agricultural Preservation and Open Space District and the California Department of Conservation for providing funding for minor revisions in March 2023.



PRINTED WITH SOY INKS ON RECYCLED PAPER.

# *Stewardship Guide* *for the Russian River*

<b>Introduction</b>	<b>1</b>
<b>Resource Conservation Districts in the Russian River</b>	<b>4</b>
<b>The Russian River &amp; Its Watershed</b>	<b>5</b>
Unique and Diverse Sub-Watersheds	7
A Tradition of Farming and Ranching in the Russian River	10
Riparian Corridors	11
<b>What You Can Do To Help the Russian River</b>	<b>12</b>
Prevent & Correct Soil Erosion	14
Properly Maintain Unsurfaced Roads and Driveways	17
Restore Native Riparian Vegetation	18
Exotic Plant Species	19
Instream Habitat Enhancement	20
Fish Passage Barriers	21
Water Conservation Measures	21
Control Runoff	22
The Storm Drain Connection	23
Maintain Septic Systems	23
Responsibly Manage Landscaping and Water Use	23
Dispose of Household Waste Responsibly	24
Attract Wildlife	25

<b>Steps for Successful Restoration Projects</b>	<b>27</b>
Technical Assistance & Funding	30
<b>Project Timeline &amp; Checklist</b>	<b>31</b>
Permitting	31
<b>Resources</b>	<b>35</b>
Russian River Watershed Directory	35
<b>Contributing Documents</b>	<b>39</b>

# INTRODUCTION

A creek flowing along your property is a valuable amenity. You and your creekside neighbors share responsibility for keeping the creek and its corridor healthy, both for people's enjoyment and for the wildlife that depend upon this fragile waterway.

In both rural and urban areas, a creek is an irreplaceable natural resource. Whether it flows year-round or seasonally, your creek provides water supply and groundwater recharge, wildlife habitat, a conduit for flood waters, and a host of aesthetic values. A creek is a part of the lives of all the people and animals that live within its watershed. A watershed is the land area which drains into the creek, including storm drain systems that carry rainwater and runoff from streets and property to the creek.

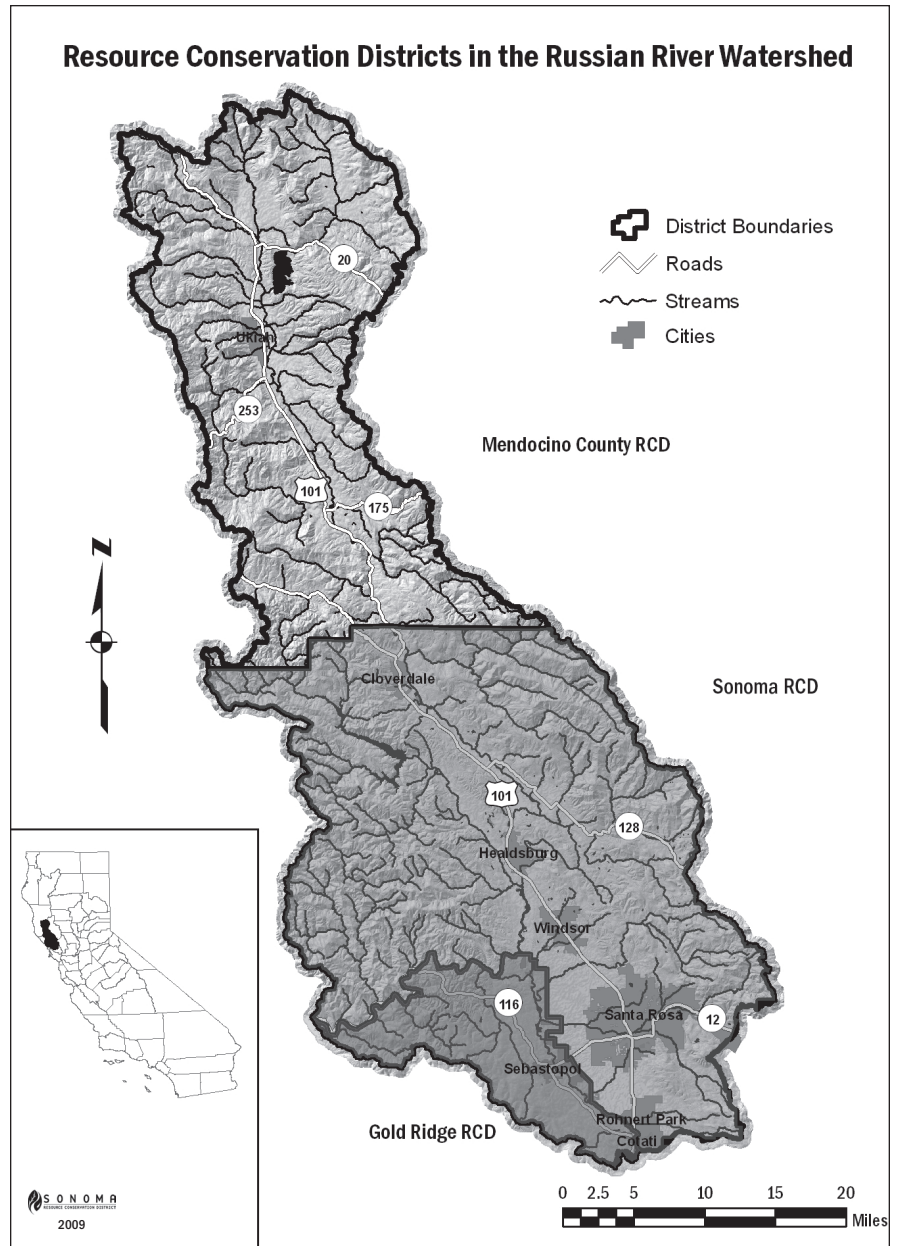
The purpose of this guide is to give rural residential landowners a sense of their place in the Russian River Watershed, to provide practical creek care information, and to offer a host of resources to





## RESOURCES

Contact information for your local Resource Conservation District (RCD) and other organizations listed throughout this document can be found in the Sonoma RCD's Russian River Watershed Directory listed in the "Resources" section of this guide.



help with the maintenance and upkeep of creekside property.

Because the Russian River Watershed is almost entirely in private ownership, landowners and local residents play a key role in protecting and improving the river's health. This stewardship guide will educate Russian River Watershed residents on how to responsibly care for their property. It contains realistic guidelines for habitat enhancement and restoration projects, including permitting requirements, and a reference section with sources for materials and project assistance.

PHOTO COURTESY OF HEALDSBURG  
MUSEUM AND HISTORICAL SOCIETY



## RESOURCE CONSERVATION DISTRICTS IN THE RUSSIAN RIVER

Please visit the following websites  
to see the district in which you  
live and information about each  
RCD's programs and services  
available to landowners:

Gold Ridge RCD  
[www.goldridgercd.org](http://www.goldridgercd.org)

Mendocino County RCD  
[www.mccrd.org](http://www.mccrd.org)

Sonoma RCD  
[www.sonomarc.org](http://www.sonomarc.org)

Resource Conservation Districts (RCDs) are legal subdivisions of the State, formed under Division 9 of the Public Resource Code to provide local leadership in the conservation of our soil, water, and related natural resources. RCDs were originally developed in the 1930's as the local non-regulatory mechanism for delivery of conservation practices to farmers dealing with the Dust Bowl, although they have grown considerably in size and scope since then. Conservation Districts exist in all fifty states. There are numerous Resource Conservation Districts in California and three in the Russian River Watershed: the Sonoma RCD, Gold Ridge RCD, and Mendocino County RCD. These organizations provide a broad variety of services to landowners in their respective districts, including conservation education, soil erosion control, water quality enhancement, range management, forestry and wildlife management, watershed and stream habitat enhancement, and water conservation. RCD programs are funded, in part, through a very small allocation of property taxes and through grant funds and cooperative agreements with other agencies. By pursuing diverse funding sources, RCDs typically leverage their constituents' tax dollars into hundreds of thousands more for on the ground projects in their districts.



## THE RUSSIAN RIVER & ITS WATERSHED

The Russian River flows 110 miles from its headwaters in the Mayacama Mountains in Mendocino County to the large estuary and beaches at Jenner. It passes through oak and Douglas fir woodlands, valleys filled with orchards and vineyards, redwood forests, and the gentle hills of the coastal grasslands before reaching the ocean. The tributaries of the Russian River drain lands as varied as the Geysers geothermal fields, the urban areas of the Santa Rosa plain, and the wildlife-rich wetlands of the Laguna de Santa Rosa. The Russian provides water to over 600,000 people in Mendocino, Sonoma, and Marin counties. Its world-class wineries, fishing, canoeing, and accessible beauty make it a major recreation destination.

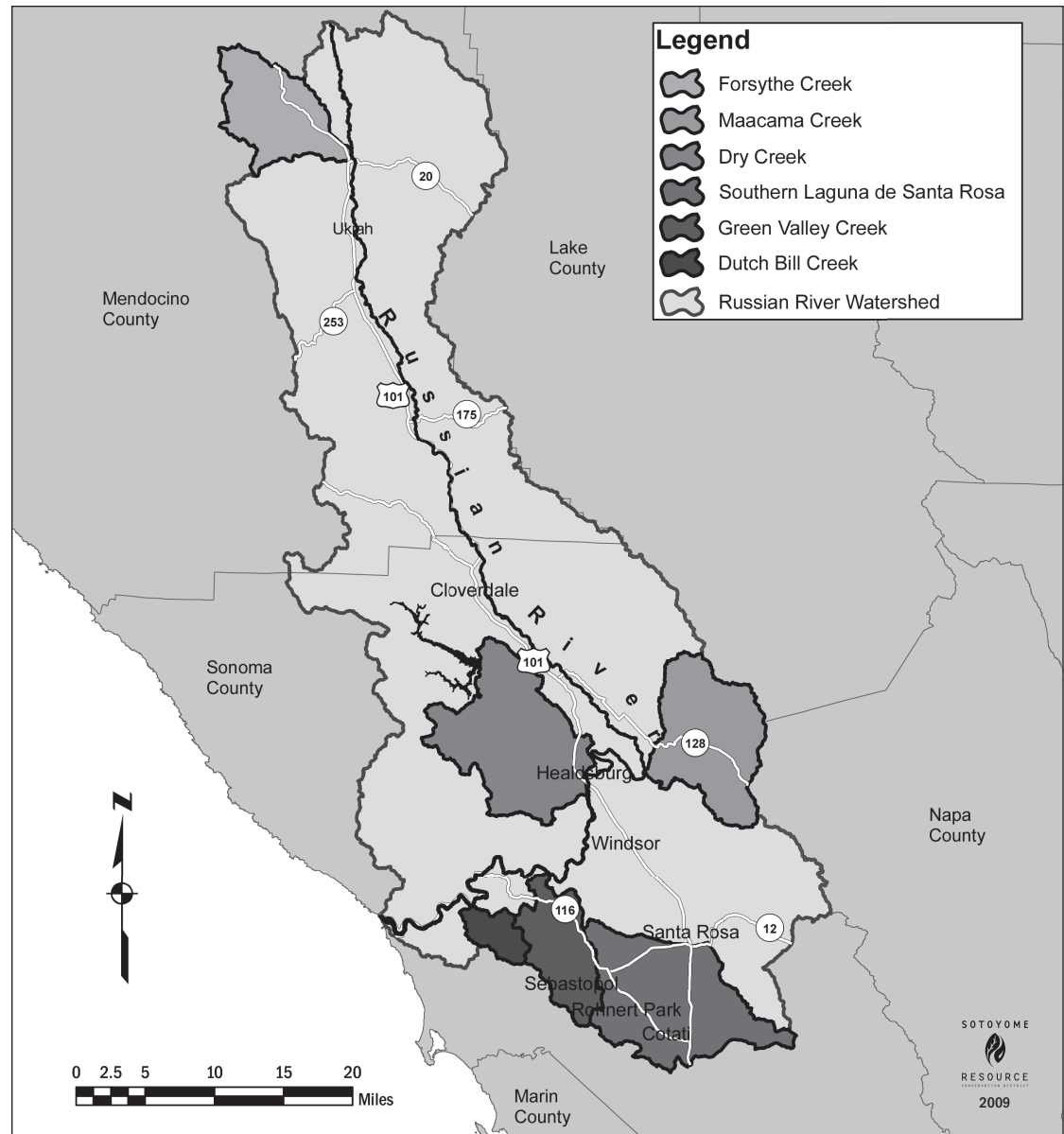
Pomo and Miwok Indians have inhabited the Russian River Watershed for thousands of years. They once thrived off the natural resources provided by the river, hunting game, catching salmon, and weaving some of the world's most beautiful baskets from riparian plants. In the summer much of the river would dry up, but life would persist with fish surviving in deep shaded pools in both the river and creeks. These pools are the rearing habitat for steelhead trout and coho and Chinook salmon: a place for them to grow before migrating to the ocean to mature. They rely on riparian habitat once again when they return to their native waters to spawn. While parts of the mainstem of the river are used by Chinook as spawning habitat, it is the highway home for coho salmon and steelhead trout. Their destination is the hundreds of miles of tributaries and creeks that feed the Russian River and comprise a vital role as their spawning and nursery habitat.



*Memorial Beach, 1909*

PHOTO COURTESY OF HEALDSBURG  
MUSEUM AND HISTORICAL SOCIETY

## UNIQUE AND DIVERSE SUB-WATERSHEDS IN THE RUSSIAN RIVER



With modern settlement, the river began to change. Riparian forest was cleared for timber and to give farmers access to the fertile floodplain for crops and grazing. Wetlands were drained and parts of the river and its tributaries were confined by levees and ditches. Coyote and Warm Springs dams along with smaller water diversions changed the timing and amount of water flowing downstream. Culverts and roads blocked salmon and steelhead access to spawning habitat. The renowned fishery dwindled. Coho salmon are now endangered in the Russian River and its tributaries, and even the once abundant steelhead trout and Chinook Salmon are listed as a threatened species.

But rivers are resilient. As we learn to understand them better, we are better able to care for them. Many efforts are underway to protect and restore the natural function and resources of the Russian River. Resource Conservation Districts, community watershed groups, local governments, and state and federal agencies are working to reduce erosion and pollutants, remove barriers to the annual upstream migration of salmon and trout, maintain good summer flows, and replant native riparian vegetation.

## **UNIQUE & DIVERSE SUB-WATERSHEDS IN THE RUSSIAN RIVER**

Nested within the Russian River Basin, there are a series of smaller watersheds that contain a unique combination of features such as geology, vegetation, topography, soil types, rainfall events, land development and management and historic land uses. Although each of the sub-watersheds share some common features, they are distinctively diverse eco-regions that further demonstrate the rich character of the Russian River. The list below is just a few of the irreplaceable regions located throughout the watershed.

### **Dutch Bill Creek**

Dutch Bill Creek is a tributary to the Russian River that originates near the Town of Occidental in west Sonoma County. The creek flows northwest along Bohemian Highway and drains into the Russian River near the town of Monte Rio. Historically, Dutch Bill Creek was good habitat for listed salmonids. Today it is one of the few streams where



*Dutch Bill Creek*



*Apple tree, Green Valley Watershed*



*Laguna de Santa Rosa*

wild coho have been seen (DFG, 2005). Common land uses within the Dutch Bill Creek Watershed include timberland, rural residential, camps and conference centers, and a limited number of orchards, vineyards, and pasture. The Sonoma County General Plan designates Dutch Bill Creek and its tributaries as “riparian corridors” and as “scenic landscape.”

### Green Valley Creek

Green Valley Creek is a major tributary in the lower Russian River Watershed, and includes the communities of Graton, and parts of Sebastopol and Forestville. It is considered critical habitat for steelhead trout, remnant populations of coho salmon, and in its lower reaches Chinook salmon. There are approximately 18.7 miles of blue line stream in the Green Valley Creek Watershed, including Purrington Creek, which contributes important summer flow to the stream system. Green Valley Creek is one of only five remaining streams in the Russian River drainage where wild juvenile coho are known to exist. Primary land use in the upper Green Valley Creek sub-watershed is a mix of rural residential, agricultural property (vineyard, orchard & pastureland), with about one-quarter of the watershed still remaining as forestland. In the Purrington Creek sub-watershed, over half of the land use is for rural residential, while only about one-third of land use is for agricultural purposes and barely 5% of the watershed is forested.

### Laguna de Santa Rosa

The Laguna de Santa Rosa Watershed is the largest sub-watershed within the Russian River Watershed Basin, and home to more the 50% of the population of Sonoma County. The Laguna de Santa Rosa is a 14 mile waterway from Cotati to the Russian River including the adjacent Santa Rosa Plain. This unique ecological system is comprised of a mosaic of open water, wetland, riparian forest, oak woodland, grassland, vernal pools, fertile agricultural lands, and urban centers including the cities of Santa Rosa, Windsor, Cotati, and Rohnert Park. Developing cities, freshwater marshes, working farms, major transport routes, and wildlife conservation are some of the many uses ascribed to this watershed.

## Dry Creek and Lake Sonoma

Dry Creek is a major tributary in the middle reach of the Russian River and meets the River just south of the town of Healdsburg. A prominent feature in this drainage is Warm Springs Dam, located 14 miles from the confluence of Dry Creek. Built in 1982 the Dam created Lake Sonoma for the purposes of flood control and drinking water supply to over 600,000 residents in Sonoma and Marin counties. Major tributaries of the watershed include Pena and Mill Creeks, as well as numerous perennial and intermittent tributaries. Conifer forest dominates the upper watershed, with zones of grassland and oak-woodland in the lower watershed and flood plain areas. Primary land uses today are vineyard cultivation, scattered rural development, grazing and recreation. Some timber is still harvested within the basin, and is often followed by conversion of uplands to agricultural use. Dry Creek and its tributaries, below Warm Springs Dam are designated critical habitat for Chinook, steelhead and coho salmon and are currently part of several efforts to restore habitat conditions and maintain viable native salmonid populations.



*Dry Creek*



*Maacama Creek*

## Maacama Creek

Maacama Creek Watershed is located on the eastern side of the Russian River and encompasses almost 70 square miles. Elevations range from about 140 feet at the mouth of the creek to 3,060 feet in the headwaters. The watershed is dominated by an oak-grass association, with the exception of the headwaters where vegetation consists of a gray pine, oak, and grass association. The riparian vegetation is generally abundant with alders and willows. The major land uses in the watershed are urban development, vineyards and cattle grazing. Coho salmon and steelhead trout exist throughout the watershed with coho being limited to reaches of Redwood and Kellogg Creeks.



*Forsythe Creek*

## Forsythe Creek

Forsythe Creek Watershed is considered the headwaters tributary to the Russian River. One of the northernmost streams to join the mainstem Russian River, its confluence is at the West Fork Russian River near





*Dairy and beef cattle production remain a sizeable part of the agricultural tradition of the Russian River watershed.*

### **WATER QUALITY IMPAIRMENTS**

The Russian River and some of its tributaries are currently listed as impaired by the Environmental Protection Agency because of high temperatures, excessive sediment and siltation, and elevated pathogen levels. Pathogens are microorganisms that can cause illness in humans and other creatures. In addition, low dissolved oxygen and high nitrogen and phosphorus are identified as problems for the Laguna de Santa Rosa. Lake Sonoma, located behind Warm Springs Dam in the Dry Creek Watershed is also considered impaired by high mercury levels.

Calpella, just north of Ukiah, the largest city in Mendocino County. Comprised of grasslands, oak woodlands, redwood forest, Douglas fir forest, mixed conifer hardwoods and chaparral, and vineyard and rangeland, Forsythe Creek Watershed includes the largest natural lake in Mendocino County, Leonard Lake. This watershed has some patches of old growth Douglas fir forest and redwood groves, as well as a few vernal pools, a tiny freshwater marsh and two mineral springs.

### **A TRADITION OF FARMING AND RANCHING IN THE RUSSIAN RIVER**

Within the U.S., California has been at the forefront of agricultural transition, first in the rapid industrialization of agriculture in the post-war period, and now in the push towards sustainability and environmental stewardship. The state currently serves as the leading producer of organic commodities, a market growing by 15–20% annually over the last ten years. A primary contributor to this movement, Sonoma County had nearly 16,000 acres in organic crop production in 2007 (not including land used for organic meat and dairy) and has been the birthplace of several certification programs focusing on sustainability, such as the “Fish-Friendly Farming” label for wineries and Clover-Stornetta’s North Coast Excellence seal for milk production. Residents of Sonoma County have repeatedly shown strong support for preserving local family farming traditions, voting to fund agricultural land preservation and attending over a dozen popular farmers’ markets throughout the county.

Farms and ranches are a vital part of the history and culture of the Russian River Watershed. Vineyards are one of the major land uses in the Russian River Watershed. As with all agricultural producers, grape growers need to plan and manage vineyards to protect natural resources. Crop cultivation can have impacts by replacing native vegetation, potentially exposing soil to erosion, fragmenting wildlife ranges, and changing the amount and timing of storm runoff.

Grazing-based agriculture can be very important in maintaining grasslands, including many native grass and wildflower species, as well as the wildlife they support. It can also create challenges to sustaining



healthy streams and rivers. Most agricultural landowners have high quality habitat on their property, while others may need assistance to improve this resource. Managing manure, protecting riparian areas from trampling and excessive browsing, controlling soil compaction and invasive weeds, and even maintaining a network of year-round roads to reach livestock are part of the ongoing work of good stewardship.

There are a variety of conservation programs available to farm and ranch owners throughout the Russian River Watershed that can assist in the identification of Best Management Practices and restoration activities needed on their properties. Contact your local RCD or refer to the resource section of this guide for more information.

## RIPARIAN CORRIDORS

The riparian corridor includes the stream channel and that portion of the adjoining landscape where the vegetation is influenced by elevated water tables, flooding, or the ability of soils to hold water. Because they provide a protected transition zone between uplands and water, riparian corridors support a rich diversity of birds and other wildlife.

Many species that once inhabited the riparian forests and waters of the Russian River are now threatened or endangered and federally protected. Riparian habitat, the vegetated area growing along the river or stream, supports the greatest diversity and abundance of wildlife in California. The roots of riparian vegetation grow in the water table of the river or stream, acting as a transition zone between the river and the land next to it. Riparian forests provide an essential link from upland habitats to food and water sources. The shade, soil stabilization, and organic matter they provide are key ingredients to healthy river systems. Examples of threatened and endangered species that use riparian resources in the Russian River Watershed include California red-legged frog (*Rana draytonii*), Coho and Chinook salmon (*Oncorhynchus kisutch* and *Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and California freshwater shrimp (*Syncaris pacifica*). Protecting, enhancing and restoring riparian habitat is one of the most effective ways to protect endangered wildlife and improve water quality.



*Coho Salmon.* BY BROCK DOLMAN

### COHO BROODSTOCK PROGRAM

In 2001, federal, state, and local agencies initiated a program of collecting a portion of the eggs produced by the few remaining wild coho salmon in the Russian River system, hatching them in the Don Clausen Fish Hatchery, and releasing them in tributaries that have recently lost their coho runs but still have good habitat. This program is ongoing and details can be found on their website at <http://groups.ucanr.org/RRCSBP>

## WHAT YOU CAN DO TO HELP THE RUSSIAN RIVER

The following are basic ingredients for healthy, well-functioning river habitat:

- Clean water that includes plenty of dissolved oxygen. Cool temperatures are critical for the survival of species such as salmon and steelhead.
- Dense streamside vegetation. Thick native stream vegetation filters sunlight, reduces erosive forces, and provides food and cover for both aquatic and terrestrial wildlife species.
- Streambed texture, such as fallen logs, gravel and cobble, and pools and riffles to enhance aquatic insect and fish reproduction and provide shelter, shade, and protection.
- Sufficient summer water flow for year round survival of aquatic species and the animals that depend on them for food.

Like all rivers in developed watersheds, the Russian River faces significant challenges. Current threats include:

- Excessive soil erosion, which decreases drinking water quality, diminishes fish habitat by filling in pools, reduces insect abundance, smothers fish eggs, and reduces a stream's ability to carry flood waters. Excess sediment in the water also reduces oxygen content in the water.

- Illegal or excessive stream diversions, which can reduce flows, thereby lowering the quality and the quantity of summer rearing habitat for steelhead, salmon, and other native fishes and aquatic organisms.
- Removal of woody material, which decreases cover habitat for fish and other wildlife and can alter pool development.
- Loss of habitat, which can occur from the removal of native plants or the construction of smooth walls along streambanks.
- Impervious or hard surfaces such as roofs and roads lessen the amount of water that soaks into the ground for groundwater recharge. This can increase flooding and lead to bank erosion problems.
- Bare, unstable streambank areas with little or no plants contribute to bank erosion and do not provide adequate shade or wildlife cover.
- Excess nutrients from manure, fertilizer, or septic systems can cause algae to grow at a high rate. Too much algae can use up oxygen in the water which in turn can cause stress or death to fish.
- Pollutants such as metals, pesticides, medicines, sewage, oil, yard waste, trash, and construction debris harm fish, wildlife and their habitats. Excess landscape irrigation, household greywater, and swimming pool or spa water that drain into waterways are also considered to be pollutants.
- Warm water ( $>60^{\circ}\text{F}$ ) can stress fish. Temperatures over  $75^{\circ}\text{F}$  can be lethal to salmonids.
- Invasive introduced plants, such as giant reed (*Arundo donax*) vary the structure and function of the riparian corridor, crowding out native species and providing little habitat or shade.



Taking care of the Russian River and its watershed is a collaborative, community effort. This section discusses proactive measures that individuals, neighborhoods, and watershed groups can implement to be good watershed stewards.

## PREVENT & CONTROL SOIL EROSION



*Cummiskey Creek. Sediment rich water mingles with clear stream flows at the confluence of two creeks. Flows on the left indicate excessive upstream soil loss.*

Soil erosion is a natural process. Sediment brings nutrients and riverbed materials to aquatic ecosystems and creates beaches at river mouths. An important function of all creeks and rivers is to transport, sort and store sediment. However, as vegetation is removed and impervious surfaces, such as roofs and roads, are added to a watershed, the process of rainfall slowly percolating into the soil to be released into streams gradually over time is impacted or impaired. In watersheds with a large percentage of impervious surfaces, rainfall rushes into stream channels in short, heavy bursts of stormwater that exacerbate flooding and can cause severe streambank erosion and gullyng. In addition, disturbed areas, such as new construction, untended dirt roads and driveways, unprotected vineyard soils, or chronically overgrazed pastures add a steady flow of fine sediments into the waterways. This sediment can be seen in the water after a storm, causing the chocolate milk look characteristic of many local streams. Too much sediment will fill in the riverbed, reduce flood capacity and destroy habitat for aquatic species.

Erosion control measures can minimize erosion and sedimentation in riparian corridors and upland areas along streambanks and dirt roads. The best way to minimize excess sediment entering waterways is to prevent soil erosion.

### Conservation Techniques to Control Soil Erosion:

- Protect bare soil surfaces. Native trees, shrubs and grasses, cover crops, or mulch (gravel, sterile straw, wood chips) hold the soil in place and allow water to soak into the soil. During construction, use sterile straw or erosion control fabrics to help protect exposed soils.
- Minimize disturbing existing plants. If plants are disturbed replant the area with native plants as quickly as possible.

- Identify and protect natural drainages and steep slopes. Do not obstruct natural flows; allow water to flow in natural drainages or sheet flow over the surface.
- Maintain existing riparian vegetation and undisturbed buffers around natural drainages.
- Avoid concentrating water flows, unless absolutely necessary. Protect water or pipe outlets by using carefully placed rock or an energy dissipater.
- Check and fix drainage concerns such as gutters, roads, and driveways after all major storms. Make sure drainage is released onto non-erosive surfaces.
- Remove debris and yard clippings dumped on the riverbank. Loose brush and debris can suppress existing bank stabilizing vegetation and contribute to bank instability.
- Build away from the riverbank and floodplain. Development near the river disturbs soils and vegetation. Building and farming too close to the river exposes structures to flooding and contributes to stream bank erosion, which can also impact structures and crops.

Even with the best prevention program, serious erosion can sometimes occur. Remember, not all erosion is harmful and undercut banks and fallen trees provide important habitat. Try to identify the source of the erosion problem and also consider what the impacts are on upstream and downstream locations. Some problems can be handled quickly with little or no outside help. Others, such as a major streambank failure or a redesign of an unsurfaced road, may require immediate professional assistance. If the erosion problem seems serious, contact your local RCD or a registered professional, such as a geotechnical engineer or a Certified Professional in Erosion and Sediment Control (CPESC).

Most work involving repairs in rivers or along river banks requires permits as well as extensive planning and design. Check the permitting requirements section at the back of this guide. In extreme emergencies, the permit process can be accelerated.

### **WHEN DO YOU NEED A REGISTERED PROFESSIONAL DESIGNER?**

Registered professional designers include engineering geologists, geotechnical engineers, civil engineers, CPESC, or landscape architects. Each has a special area of expertise, but any of them should be able to direct you to the one best suited to help you. A registered designer is needed:

- If your house or other important utilities and infrastructure (road, septic system, etc.) are threatened.
- To get a grading permit from Sonoma County.
- If you need to move soil, rock or build retaining walls to stabilize your streambank.



*Pena Creek Watershed. Slide stabilization.*



*Erosion control installation.  
Little Black Mountain, Austin Creek*

Following are some commonly used erosion control techniques. The reference section at the back of this guide includes sources of materials as well as places to get more detailed instructions:

- Mulch to protect bare slopes, either alone or after seeding. Mulches reduce runoff and erosion, conserve moisture, buffer temperature, control weed growth, protect seed and prevent compaction and crusting. Mulches should be sterile straw, wood chips or shavings, or pine needles. Mulch should usually be laid down 2-3 inches deep. If layered too thick, seed will not be able to germinate.
- Re-seed with a native plant mix to stabilize some banks and control some surface erosion. For successful seed application, compacted soils should first be aerated and a fertilizer safe for use near rivers should be applied. Seed should then be applied and buried half an inch deep by raking into soil. Seed should be applied between September 15th and October 15th. Supplemental irrigation will be required until the rains begin or if seed is planted before September 15th.
- Stabilize soils and prevent erosion with bioengineering techniques. These practices include willow walls, brush mattresses, and tree revetments along eroding riverbanks.
- Regrade banks to a gentler, less steep slope that is able to support vegetation. The steeper the slope, the greater chances for erosion. This work may require permits.
- Avoid using erosion control blankets with plastic mesh because they are harmful to wildlife.
- Energy dissipaters are simple structures consisting of rock rip-rap, rock filled containers, and other non-erosive materials. These slow the flow of water, thus reducing its scouring force on soil. Dissipaters can be placed at the outlets of channels, drains and culverts. Make sure dissipaters are large enough to stay in place and will not be carried away by the force of water.



- Waterbreaks are a series of bars built into roads that redirect runoff and decrease velocity.
- Line roadside ditches with vegetation or rock.

Because flowing surface water usually crosses property lines, it is important to work with your neighbors to develop and implement solutions. Correcting erosion problems will benefit you and your neighbors. Even if it is not necessary to work with a neighbor to correct soil erosion, bank protection work can often cause erosion downstream and upstream. Keeping your neighbors informed from the beginning can prevent future conflicts.

## PROPERLY MAINTAIN UNSURFACED ROADS AND DRIVEWAYS

Road erosion is one of the leading causes of sedimentation, stream channel instability, and habitat fragmentation. Roads and driveways serve an important function and how we build and use them determines their impact on our watershed. Stormproofing roads and driveways, using certain roads only during specified seasons, and decommissioning roads can all help reduce the impact. Inspecting your road network and identifying problem areas can help you eliminate the highest priority concerns first. Road upgrades can be expensive, but financial assistance is frequently available.

If you determine that your roads need significant improvements, a road contractor or restoration specialist can help you develop a sediment reduction plan. Be sure to ask your contractor if they have ever attended rural road workshops or worked on road upgrades. Most activities associated with this work will require permits. RCDs are very successful at locating grant funding and implementing rural road improvement projects. They may be able to help you find funding for your project as well as help you implement it. The Mendocino County RCD's Handbook for Forest and Ranch Roads can provide more information on road improvement and management and its methods are approved by the North Coast Regional Water Quality Control Board and the California Department of Fish and Game.



*Hobson Creek Watershed. Rural roads can collectively contribute large amounts of sediments to creeks. Stormproofing them is often the quickest way to reduce sedimentation in a watershed.*

Remember that a stormproofed road is not a maintenance-free road. You must still take care of your road regularly and observe any changes that require further reconstruction; however, your maintenance costs may drop significantly.

## RESTORE NATIVE RIPARIAN VEGETATION



*Ithuriel's Spear*

One of the best ways to protect the river is to keep the banks naturally vegetated with native plants. The plants along the banks of the stream are called riparian plants; they protect water quality by filtering out sediment and other pollutants before they enter the water. Roots reinforce the river bank and help protect the banks from eroding. Some other benefits of riparian vegetation include:

- Slowing and dissipating the energy of floodwaters.
- Shading and cooling the stream during the summer, moderating water temperatures for salmonids and the aquatic creatures they depend on for food.
- Providing food and shelter for wildlife as well as maintaining the natural beauty of the creek.
- Recycling and storing nutrients from the soil and surface water.

Many native plants continue to be used by California Indians for basket weaving and other traditional arts. Vigorous, properly cultivated stands of plants such as dogbane and sedges with long straight rhizomes are becoming increasingly rare. Contact the California Indian Basketweavers Association (CIBA) if you are interested in helping to provide collection sources.

### *Tips for Planting Natives*

- Observe nearby vegetation to identify what to plant.
- Visit a native plant nursery to help select species that will thrive on your property and on your streambank.
- Contact a restoration specialist to develop a planting and supplemental irrigation plan if the planting area is large.

- Some native plants are more deer and fire resistant than others; consider this when selecting plants.
- Weed and water your plants for the first 3-5 years to help them become established. Once native plantings become established, they can survive without supplemental irrigation, fertilizer, or pesticide.

## Native Plants to Encourage

Keep in mind that although native riparian plants are all suited to the riparian corridor, they each have different growing requirements. More information on this can be found in Circuit Rider Productions, Inc. and Sonoma County Water Agency's: A Guide to Restoring Native Riparian Habitat in the Russian River Watershed.

When purchasing plants, select them using the botanical name; the common name usually refers to more than one species of plant, many of which can damage the riparian corridor. Additionally, be aware if there are many horticultural variations of wild plants, even if you use the botanical name to select your plants. In order to minimize the introduction of plants that may be inappropriate in the riparian corridor, be sure to mention to nursery staff that you are planting in a "wild" area.

## EXOTIC PLANT SPECIES

Exotic plant species are those not native to the Russian River Watershed. Many are invasive and spread rapidly, choking out beneficial natives. Exotics generally offer little or no habitat value to wildlife and little erosion protection. The best way to remove exotic species is by hand, followed by replacing them immediately with native vegetation to prevent soil erosion. If the amount of exotic material is too thick or too much to remove by hand, other forms of removal can include mechanical removal, tarping, herbicide, or grazing. To determine what methods will work best for you, call the UC Cooperative Extension office, Agricultural Commissioner's office, or your local RCD. You may also want to reference the previously mentioned Guide to Restoring Native Riparian Habitat in the Russian River Watershed. Removal of invasives from the riparian corridor may require a permit. *Arundo donax*, a bamboo-like

## PIERCE'S DISEASE

Pierce's Disease is a disease affecting grapes and is a constant management concern to vineyard operators. Restoration projects around vineyards should take into account native plants that may host the disease and consider techniques that control or eliminate the non-native hosts.

Contact your local University of California Cooperative Extension Office or local RCD for more details about Pierce's Disease.



*Austin Creek. Fallen trees create pools in creek beds, providing deep, cool refuge areas for migrating fish and other aquatic species.*

### **WHAT DO SALMON AND STEELHEAD NEED?**

**Clear, cold water.** Temperatures between 55°F and 60°F are preferred. Temperatures over 75°F can be lethal to salmonids.

#### **Adequate flows for upstream and downstream migration.**

Salmon and steelhead need sufficient flows at the right times to move to and from the ocean.

**Protection from predators.** Tree trunks and other large pieces of wood are extremely important, especially for coho salmon.

**Clean, sufficient spawning gravels.** Fine sediment in the gravel restricts the flow of oxygen to the eggs. Watershed changes in flows or sediment delivery can cause spawning gravel to be washed away or buried under fine particles.

*(continued next page)*

plant is considered one of the biggest threats to riparian habitat in the Russian River Watershed. It can cause serious flood problems, is a fire hazard, and consumes more water than native plants. Contact the Sonoma RCD in Sonoma County and the Mendocino County RCD in Mendocino County for information about control efforts.

Once invasive plants are removed, monitoring and maintenance are required. Invasive species will reappear even after they seem to be successfully removed; seeds may remain viable in the soil for several years. Monitor your revegetated sites regularly and remove any invasive seedlings as they are quick to re-establish themselves.

### **INSTREAM HABITAT ENHANCEMENT**

Fallen logs, tree stumps and branches provide cover, food and shelter for fish and other aquatic animals, notably young coho salmon and steelhead trout. As a natural component of a well-functioning stream system in our region, woody debris plays an important role in creating the diversity of habitats needed to support fish and other aquatic species throughout their life cycles. Pools form downstream of logs, branches provide shade as well as perches for birds and the insects that feed most aquatic creatures, and large pieces or clusters of woody material trap sediment and spawning gravels.

Some important tips to keep in mind while managing woody material in and surrounding your stream:

- Woody material should be left in the creek whenever possible but in some cases, woody material may need to be modified or removed. Woody material can redirect water to accelerate bank erosion or dam flow to create potential flood hazards. In an emergency, you have the right to modify or remove the material, but must notify the California Department of Fish and Game (preferably prior to the work) within 2 weeks. In a non-emergency, contact Fish and Game for advice or information on obtaining a permit. You can also contact the Sonoma or Mendocino County Water Agencies or the relevant county planning department if you are concerned about flooding.

- Most fish can swim through or around log clusters. If you know that fish can't swim through a barrier, contact the California Department of Fish and Game.
- Brush, weeds, grass clippings, or other small material should not be thrown into a creek or stored near creek banks to be carried downstream by wind or rain. The brush may create a debris jam downstream on someone else's property or block a culvert, which can cause flooding and erosion or block fish passage.

If you're interested in enhancing fish habitat by placing large woody debris in your reach of stream, contact your local RCD for more information.

## FISH PASSAGE BARRIERS

A fish barrier is an obstacle that prevents or inhibits the natural migration of salmon, steelhead, and other native fish. These barriers typically include culverts, dams, weirs, and floodgates. Barriers also include natural features such as waterfalls and logjams. Improper placement of structures, such as culverts, can cause water velocities to be too high and water depths to be insufficient. These barriers can also cause behavior changes in fish. Barriers can have a significant impact on native fish by restricting migration during spawning. As fish congregate at barriers, over crowding increases the likelihood of stress, injury and predation. Barriers also lead to the under-utilization of the habitat isolated by the barriers. Removal of fish barriers will allow fish and other aquatic creatures to fully utilize the stream and swim freely throughout the watershed. Removal of barriers requires permits. Before removing a fish passage barrier, contact the California Department of Fish and Game or your local RCD for technical assistance.

## WATER CONSERVATION MEASURES

In order to keep flows high enough to support life in the river, especially during the summer months, refrain from taking water directly from the river. During the summer months, when water levels get low, fish habitat is threatened and additional water diversions only add to the problem. Excessive water use decreases underground stream flows, which are critical for summer pools.



*Dutch Bill Creek Watershed. Fish migrating upstream often cannot pass over old dams like this one, even at high flows.*

### WHAT DO SALMON AND STEELHEAD NEED? *continued*

**Access to habitat.** Poorly designed culverts, road crossings, and/or dams can prevent adult salmon and steelhead from reaching historic spawning areas, or juvenile fish from safely moving through the stream.

**Deep, cool pools for rearing.** Young coho salmon and steelhead spend at least one summer in the stream before returning to the ocean. Most Chinook return to the sea the same year they were hatched.

**Clean water.** Water conveys everything it touches into creeks and rivers. Stormwater flows can carry everything from excess sediment to pesticides to motor oil into our waterways. Wastewater discharges from treatment plants are regulated, but can still carry pathogens and nutrients into rivers and may hold undegraded medicines and household chemicals that resist breakdown. All the organisms in a watershed depend on water that is free of unnatural contaminants.

### **FIRE PREVENTION/SAFETY/ SUDDEN OAK DEATH**

Since the mid-1990s, Sudden Oak Death has contributed to substantial mortality in tanoaks, most oak tree species, and other large Northern California trees. The disease is caused by a water mold that thrives in cool, wet climates, mostly in evergreen/tanoak/redwood forests within the fog belt. In the Russian River Watershed, it is the lower river and tributaries where most of these impacts are being seen. Landowners in this area should be alert to changes in the surrounding woodlands and work to manage the increased fuel load associated with these dead trees accordingly.

The following are ways in which water diversion can be minimized:

- Conserve water.
- Use low volume pumps and pump to storage tanks.
- Pump at night when natural stream flows are higher and evaporative losses are lower.
- When possible, use wells instead of directly pumping from the river.

### **CONTROL RUNOFF**

Rain water either soaks into the soil or flows through ditches and underground pipes directly into a stream. Rain water runoff can pick up soil, manure, pet waste, chemicals, and garbage that are carried directly into the Russian River. Stormwater that flows off land without soaking into the ground adds to creek flows and reduces groundwater recharge. The higher flows in the river can cause erosion of the creek bed and banks as well as flooding problems downstream.

#### *Ways to Minimize Runoff:*

- Direct all gutters or downspouts to areas where the water can soak into the ground instead of storm drains.
- Minimize paved or other hard-surfaced areas. Driveways, walkways, and patios increase the amount of water that flows into rivers, creeks, ditches, and storm drains. Instead of concrete, use wooden decks, brick or stone paths, gravel, permeable pavement, paving stones, or concrete blocks so that water can permeate through spaces and soak into the ground.
- Keep water and pipes from flowing directly to the river or onto river banks. Divert water away from riparian areas and onto flatter ground so as not to destabilize river banks and contribute sediment to the stream channel.
- Keep plants on river banks. Roots of riparian plants will help stabilize the banks.



## THE STORM DRAIN CONNECTION

In urban areas, water running off lawns, gardens, roofs, and paved areas such as streets, sidewalks, driveways, and parking lots empty into a storm drain system. Water passing through the storm drain system receives no treatment before entering local creeks and the Russian River. Water entering the storm drain system can pick up soil, chemicals, garbage, and other pollutants and is a major source of water pollution in California. For more information about what you can do to prevent unnecessary contaminants to a nearby storm drain contact the City of Santa Rosa's Stormwater and Creek's Department or the Stream Maintenance Section of the Sonoma County Water Agency. In Mendocino County, call the Mendocino County Water Agency or the Division of Environmental Health within the Mendocino County Public Health Department.

## MAINTAIN SEPTIC SYSTEMS

The Russian River area is home to many old summer cottages with inadequate, outdated, and/or failing septic systems. Human waste leaking from faulty septic systems is a significant source of water pollution. If you live by the river and use a septic system, make sure it is functioning efficiently. For more information, see the Sotoyome RCD's *Homeowner's Guide to Septic System Operation*, the Sonoma County Water Agency's Safe Medicine Disposal Program, and Mendocino County's Division of Environmental Health.

## RESPONSIBLY MANAGE LANDSCAPING AND WATER USE

How you manage your home landscape has a dramatic effect on the health of the watershed, especially for those with property adjacent to the river.

- Compost leaves, grass clippings, and other organic waste away from the creek. Although leaves and organic waste are biodegradable, adding them to a creek depletes oxygen in the water and can stress or kill fish and aquatic life.
- Avoid or minimize the use of fertilizers and pesticides (including insecticides and herbicides), especially during



*In paved environments, water flows directly through storm drains into creeks. This rapid introduction of water into streams, instead of into the ground, can increase flooding in large storm events.*

### **PROTECT YOUR PROPERTY WITH CONSERVATION EASEMENTS**

Conservation easements are an important tool for landowners who want to preserve natural resources and/or restrict the use of their property in perpetuity. Many public and private organizations will purchase easements for, or accept donations of, development or resource extraction rights. Forest trusts, for example, purchase timber rights in exchange for a landowner agreeing to restrict logging not only through the term of his or her ownership, but for all future owners. Many local private land trusts and open space districts hold easements that prevent or restrict development in order to protect important habitat or preserve farmland and open space.

rainy or windy days. Follow the label directions, as excessive amounts of some nutrients are toxic to aquatic life.

- Properly irrigate lawns and gardens. Over-watering adds excess water, fertilizers, pesticides, and soil to ditches and storm drains and is also a common cause of streambank erosion.
- Consider replacing a lawn with native plants that will require little water and no fertilizers to maintain. Local municipalities, nurseries, and the Sonoma County Water Agency offer incentives and planting suggestions to help manage landscape water use.
- Do not hose down paved surfaces, like driveways. Use a broom instead and put debris in a trash can.
- Wash vehicles and equipment in a grassy or gravel area where soapy water can filter into the soil or use a car wash facility that recycles water. Soap—even biodegradable—can harm fish and other aquatic life.

### **DISPOSE OF HOUSEHOLD WASTE RESPONSIBLY**

How you dispose of your household waste also has a dramatic effect on the health of the river, no matter how far away from it you live. Even in small amounts, hazardous materials such as paint, motor oil, solvents, pool chemicals, batteries, and many cleaners will contaminate a river and harm fish and wildlife. It's illegal to dispose of or dump hazardous materials on roadways or into storm drains or ditches.

- Take all hazardous items (paint, solvent, oil, pesticides, rinse water, etc.) to a household hazardous waste collection event. Call the Sonoma County EcoDesk or Mendocino County MendoRecycle for dates, times, and locations.
- Properly care for pools and spas. Water and backwash filter rinse water should be drained to the sewer. Chlorine and algaecides used in pools and spas are toxic to plants and aquatic life. Use pool covers whenever possible to avoid water loss through evaporation.

## ATTRACT WILDLIFE

The banks of the river and riparian forests have been home to wildlife long before property lines and backyards were established. Riparian forests create corridors through which birds and other animals move. These corridors allow fish and wildlife to cross their ranges and into different habitat types. With conversion of riparian forest to other land use and the fragmentation of the remainder into ever smaller pieces, animals are being pushed out of the riparian landscape at a rapid rate. Riparian landowners have a unique opportunity to ensure native wildlife species continue to have a place they can call home.

- Protect and enhance the riparian vegetation on your property.
- Unless there is a safety issue, keep your standing dead trees (snags) and dead limbs. Snags and dead limbs are important resources for cavity-nesting and roosting species, such as ducks, woodpeckers, chestnut-backed chickadees, bats, and other small mammals.
- If you must remove a tree or a snag, do this work during the non-nesting season for birds (generally outside of the period from March 1st – August 1st).
- Leave downed woody material on the riverbank to provide cover and feeding areas for wildlife. If necessary for safety reasons, you can remove material during the non-breeding season.
- Avoid clearing dense native understory vegetation to create open park-like areas (except as needed for fire safety). Understory vegetation provides foraging sites and concealment of ground nests.
- Direct security lighting away from the riparian corridor to minimize disturbances to roosting and nocturnal wildlife, such as bats and owls.
- Avoid planting invasive, non-native plant species, such as acacia, ivies, vinca, and periwinkle in your riparian area.
- Do not release or encourage non-native wildlife, such as bullfrogs and exotic fish, into the river.



*Northern flicker.*

- To protect native birds and other wildlife and to help reduce your County's feral cat population, participate in your County's low-cost spay and neuter program. Do not leave food outdoors that can attract feral animals to your property.

## STEPS FOR SUCCESSFUL RESTORATION PROJECTS

Should you decide to proceed with a restoration project on your property, the following steps will help complete the project from site assessment through implementation and maintenance. Restoration is rarely a quick fix, and often requires several months for implementation and several years of monitoring and adjusting. The reward is that your land will be easier to maintain, and you will have contributed to the health of your watershed.

### Step 1. Project Preparation

First, gather and organize information on your project site and conditions. This will be helpful when talking to agencies or restoration specialists, as you will have the answers they are looking for and will speed up the process.

Maps are an excellent tool for recording physical features and problem areas. Topographic maps and aerial photos can be especially useful. If you don't already have a property map, such as one prepared by a surveyor, parcel maps can be obtained from county planning agencies.

Walk your property with the aerial photo, parcel map, or topographic map in hand and customize it by labeling features such as property boundaries, streams, roads, stands of trees and any other notable features. Use a pencil when labeling your maps so mistakes can be erased. Also, make multiple copies of your base maps before drawing on them or walking with them on your property, as they can easily get ruined. It



*Native plant revegetation  
on creek bank.*



*Installation of large woody  
debris for fish habitat.*



*Removal of *Arundo donax*  
near the Russian River.*

is also recommended to keep a written record of things you notice on your property and make sure you date all of your maps and entries.

Sites of special interest or concern on your property can be easily monitored by photographing them from the same vantage point at regular intervals over a period of time. First, establish the area you want to monitor. Label the area being photographed on one of your maps and the spot where you take the photo. Mark your shooting location with a stake or pile of rocks to make sure you photograph the site from the same vantage point every time.

## Step 2. Project Planning and Design

Project assessment and planning takes the information you have obtained about your property and turns it into a clear program for improvements. The following steps may help:

- Make a list of all the improvements you would like to make on your land.
- Prioritize them, identifying the most important projects. By prioritizing, you won't lose sight of the bigger issues that could take significant time, money and planning to address.
- Call your local RCD or a restoration specialist and discuss the best way to proceed with designing and completing your plans for improvement.

You may need to obtain professional surveys of your project site or have other professional services rendered on your property before the design process can begin. The sidebar on page 15 can help you identify when you need a licensed professional designer.

## Step 3. Acquire permits

The permitting section on page 31 describes the types of permits needed for common restoration projects. Remember to get started early. State and federal agencies often appreciate being notified early in the planning process so that their comments and recommendations can be



incorporated into your design. This can substantially speed up the time they need to review and approve your completed permit application.

#### Step 4. Project Implementation

Some restoration projects are small enough to do yourself, but in many cases you will need to hire a qualified, licensed contractor who specializes in environmental restoration work. Your local USDA Natural Resources Conservation Service staff (NRCS), RCD, or a restoration specialist may be able to provide you with a list of contractors for you to consider.

Construction of restoration projects in or near streams and rivers usually takes place between mid-July and mid-October. If a permit is required, the conditions of the permit often include construction timing constraints.

Remember to keep your neighbors, and all involved parties, informed of the construction timeline. If communication is good between all parties, then the construction process will be smoother.

#### Step 5. Project Maintenance and Monitoring

Once your restoration project is in place, the tasks of project maintenance and monitoring begin. Many restoration projects are composed of living materials within living systems; they need routine maintenance for a period of time to become firmly established. The maintenance period is just as important as the construction period. Some agencies require a certain level of money or effort for maintenance as a condition of a permit or grant assistance.

Monitoring a project to ensure there are no failures after construction is equally important to overall success. The longer a problem goes unnoticed, the more difficult (and expensive) it is to fix. A monitoring report can be a collection of photographs from fixed points over a regular time period or a series of consistent observations. The key to recording monitoring information is regularity and consistency.

Some examples of common maintenance practices include:

- Irrigating and weeding areas that have been revegetated.

#### MAPPING RESOURCES

Soils maps are available from county planning agencies, the Natural Resources Conservation Service (NRCS), and the U.S. Geological Survey (USGS). The USGS quad maps are less detailed, but can be purchased on-line at [www.usgs.gov](http://www.usgs.gov). Aerial photos can be ordered from the WAC Corporation at [www.waccorp.com](http://www.waccorp.com). Aerial photos can also be viewed at your local RCD or NRCS office. (See resource guide for contact information.) Call one of these locations to find out if aerial photographs are available for your property. The NRCS has an online soil mapping resource for questions about soil types that you can expect to find on your property.

- Checking culverts during the first storms and cleaning out any debris.
- Checking repaired erosion areas after the first storms to ensure stability.
- Routine maintenance of roads.

## **TECHNICAL ASSISTANCE AND FUNDING**

Your local RCD and the NRCS may be able to provide both technical and funding assistance when you plan your project. These agencies also offer workshops and educational materials on roads, rangeland management, erosion control, and other programs. Contact your local RCD or NRCS office for a schedule of upcoming workshops.

Funding sources for restoration projects include local, state, and federal agencies, as well as private foundations. If eligible for a grant, your local RCD or restoration specialist can help you through the application process. NRCS can help agricultural landowners apply for many federal farm bill cost share programs.

Grants are sometimes looked upon more favorably if they are applied for by more than one landowner—for instance, multiple landowners in association with a local watershed group or RCD. When working with a group, you can combine resources, get volunteer labor, and share ideas. When funders review grant proposals, they often factor in how many people are involved and how much of the watershed will be restored. Additional tips:

- Plan ahead. Grants can take up to a year to obtain.
- Develop clear, achievable objectives for the project.
- Most grants require “matching funds” so be prepared to contribute to the cost of the project in labor, materials, and/or cash. Each grant source will have its own cost share requirements.

# PROJECT TIMELINE & CHECKLIST

## PERMITTING

Many restoration projects require permits from county, state, and federal agencies. A permit is an agreement between you and a resource agency stating you will follow certain guidelines in implementing your project. Permits stem from regulatory agency mandates that are established to ensure land use practices and construction projects do not have adverse impacts on the environment.

As a landowner, you may find you need to apply for multiple permits. Projects that require permits can include road restoration, riverbank or streambank repair, projects that change the use of a wetland or add fill to it, and diversion or storing of surface water.

Permitting can be time consuming and take up to a year to complete. The table on page 33 describes permits required for restoration projects and common land management practices. Contact information for permitting agencies is located in the Sonoma RCD's *Russian River Watershed Directory*. Call one of the listed agencies or your local RCD to verify if your project needs a permit.

Erosion control measures must be in place before the onset of winter rains. Most permitting agencies require these measures to be fully installed by mid to late October. This means that any grading or earth disturbance needs to take place prior to this time, usually June 15<sup>th</sup> through October 15<sup>th</sup>.

Planting is best done after the first rains when the soil begins to moisten. Container plants can be planted through February. Biotechnical erosion control projects or planting projects requiring willow sprigs need to be done in the narrow window between when the willows lose their leaves and heavy rains begin, usually around December.

*Getting help from your local RCD or NRCS office*

The following is helpful information to have on hand before calling for technical assistance:

- Name and contact information.
- Written directions to your property.
- Are you an agricultural producer? What type of production?
- Do you harvest timber?
- Map and/or aerial photos of your property showing the project location.
- Soils information, if available, on the project site.
- Any monitoring information, such as photos.
- Your questions.
- Your goals.

### Within city limits

Work within city limits may be subject to additional regulations beyond those in place for unincorporated areas of the watershed. These ordinances vary from city to city and should be checked as part of project planning as local regulations can influence your project implementation timeline.

PERMIT	AGENCY	AREA OF CONCERN
1600 Streambed Alteration Agreement	CA Department of Fish and Game	Section 1600 of the Fish and Game Code requires a permit for any action taking place in the bed, bank, or channel of a stream.
401 Certification, Waiver of Waste Discharge Requirement	North Coast Regional Water Quality Control Board	Section 401 of the Federal Clean Water Act ensures that actions in or near stream channels do not increase the level of pollutants in streams—including sediment and temperature.
404 Permit, Section 10 Consultation	US Army Corps of Engineers	Section 404 of the Clean Water Act requires Army Corps authorization for work that may result in a sediment discharge into a wetland or stream. Section 10 of the Rivers and Harbors Act requires Corps authorization for work or structures that affect navigable waters.
Incidental Take	US Fish and Wildlife Service (USFWS)	USFWS is concerned with recovery of species of animals or plants that are listed as either threatened or endangered under the Federal Endangered Species Act. For the Russian River watershed, these species include steelhead trout, Coho salmon, California freshwater shrimp, California tiger salamander, and many plants. Under the federal Endangered Species Act, take means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” listed species. Incidental take means take of listed species while carrying out otherwise lawful activities. Incidental take is authorized through the issuance of a permit from the federal government.
Incidental Take, or Sect. 10 of the ESA	NOAA Fisheries (formerly National Marine Fisheries Service)	NOAA requires written authorization for projects that may affect anadromous fish, such as salmon and steelhead.

PERMIT	AGENCY	AREA OF CONCERN
Grading & Drainage	Sonoma County Permit and Resource Management Department (PRMD), Mendocino County Planning & Building Services	Projects that involve excavation of more than 2 feet in depth and/or fill of more than 50 cubic yards require a Grading Permit. Sonoma County has a grading permit exception for fisheries restoration projects. Check with PRMD to see if your project qualifies.
Zoning	Sonoma County Permit and Resource Management Department	Zoning permits are discretionary, meaning they need to be covered by the California Environmental Quality Act (CEQA), and are usually required for work in biotic or scenic resource zones.
Building	Sonoma County Permit and Resource Management Department, Mendocino County Planning & Building Services	Any new structure, including a bridge, requires a building permit.
Roiling	Sonoma County Permit and Resource Management Department	A Roiling Permit is required when a natural waterway will be disturbed by construction activity.
Coastal Development	Sonoma County Permit and Resource Management Department, Mendocino County Planning & Building Services	Work within the Coastal Zone requires a Coastal Permit.



## RESOURCES

### WHO'S WHO: RUSSIAN RIVER WATERSHED DIRECTORY

In 2006, the Sotoyome Resource Conservation District assembled this directory of professionals, educators, organizations, governmental agencies, and individuals with an active interest in natural resource management and stewardship. Rather than provide an exhaustive list of entities and organizations related to resource conservation in the Russian River Watershed, users of this guide are encouraged to refer to the Sonoma RCD's Russian River Watershed Directory: <https://sonomarcld.org/wp-content/uploads/2017/06/RussianRiverWatershedDirectory2012Final9.19.12.pdf>

*Selected References and Publications (available at your local RCD)*

### Stream and Riparian Management

*A Guide to Restoring Native Riparian Habitat in the Russian River Watershed.* Circuit Rider Productions, Inc. and the Sonoma County Water Agency. 1998.

*Creek Care Guide, A Guide of Rural Landowners and Residents of Petaluma and Sonoma Creek Watersheds.* Southern Sonoma Resource Conservation District. 1995.

## NATIVE PLANT NURSERIES

The following is a partial listing of the local resources available to landowners interested in planting native plants or installing erosion control measures. If you are shopping at another nursery or home improvement store just make sure to inquire about whether or not their plants are native to the area.

Appleton Forestry  
(by appointment only)  
1369 Tilton Road  
Sebastopol, CA 95472  
707.823.3776

California Flora Nursery  
Somers & D Street | PO Box 3  
Fulton, CA 95439  
707.528.8813  
[www.calfloranursery.com](http://www.calfloranursery.com)

Mendocino College Ag Department  
1000 Hensley Creek Road  
Ukiah, CA 95482  
707.468.3000

Anderson Valley Nursery  
18151 Mountain View Rd.  
Boonville, CA  
707.895.3853

(continued next page)

*California Salmonid Stream Habitat Restoration Handbook*. California Department of Fish and Game. 1998 with updated sections.

*Creek Steward Handbook*. City of Santa Rosa Public Works Department/Sonoma County Water Agency.

*Stream Crossing Inventory and Fish Passage Evaluation Final Report*, 2003. Taylor, Ross N., Thomas D. Grey, Anabel L. Knoche, and Michael Love. Russian River.

*Fish Facts; Salmon and Steelhead Trout*. Laurel Marcus for the Sotoyome Resource Conservation District. 1997.

## Invasive Plant Management

*The Weed Workers' Handbook*. The Watershed Project and California Invasive Plant Council. 2004.

*Invasive Plants of California's Wildlands*. Bossard, Carla, John Randall, and Marc Hoshovsky, University of California Press. 2000.

## Erosion Control/Roads

*Groundwork—A Handbook For Small Scale Erosion Control in Coastal California, 2nd Edition*, 2007. Prunuske Chatham, Inc. for Marin Resource Conservation District

*Handbook for Forest and Ranch Roads: A Guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads*. Weaver, William E, and Danny K. Hagans. 1994.

## Livestock and Grazing Management

*Grazing Handbook: A Guide for Resource Managers in Coastal California*. Lisa Bush, Certified Rangeland Specialist, for Sotoyome RCD. 2006.

*Managing Riparian Pastures in the Marin Resource Conservation District*. A Collaborative Effort of UC Cooperative Extension, Jeffrey Creque, PhD, and the Marin Resource Conservation District. 2005.

*Fact Sheets for Horse Owners.* Alameda County RCD.  
[www.acrcd.org/ForRuralLandowners/EquineFacilities.aspx](http://www.acrcd.org/ForRuralLandowners/EquineFacilities.aspx)

*Horse Owners Guide to Water Quality Protection.* Council of  
Bay Area Resource Conservation Districts. 2001.

## Water Conservation and Quality

*Sustainable Agriculture Network. Smart Water Use on Your Farm or Ranch.*  
[www.sare.org/publications/water.htm](http://www.sare.org/publications/water.htm) UC Cooperative Extension.  
Farm Maps. Farm Water Quality Planning Reference Sheet 7.4

*Storing Runoff from Winter Rains.* Publication 8211. Schwankl,  
Lawrence et al., UC Cooperative Extension.

## Vineyards

*Code of Sustainable Winegrowing Practices Workbook.* California  
Association of Winegrape Growers. December 2006.

*Vineyard Site Assessment Guide: A primer for effective interaction  
with resource and regulatory agencies in Sonoma County.* Lewis,  
David et al. UC Cooperative Extension. 2002.

*The Vineyard Manual, A Grapegrower's Manual for Vineyard Development and  
Maintenance.* Southern Sonoma Resource Conservation District. 1993

*Fish Friendly Farming Certification Program.* Laurel Marcus for the  
Sotoyome Resource Conservation District. 1998 & 2002.

## Fire Safety

*Fire Safe Sonoma. Living with Fire in Sonoma County: A Guide  
for the Homeowner.* Mendocino County Fire Safe Council.  
Wildfire Risk Assessment: [www.firesafemendocino.org](http://www.firesafemendocino.org).

## Home

*The House and Garden Audit: Protecting Your Family's Health and Improving  
the Environment: A Guidebook to Reducing Your Impacts on the Environment.*  
Laurel Marcus for the Sotoyome Resource Conservation District. 2001.

## NATIVE PLANT NURSERIES (cont.)

The Center for Environmental and  
Social Stewardship  
Native Plant Nursery  
9619 Old Redwood Highway  
Windsor, CA 95492  
707. 838.6641

Le Ballisters Seed  
1250 Sebastopol Road  
Santa Rosa, CA 95407  
707.526.6733  
[www.leballistersseed.com](http://www.leballistersseed.com)

Jail Industries Plant Nursery  
(by appointment only)  
2254 Ordinance Road  
Santa Rosa, CA 95403  
707. 525.8310

Erosion Control Suppliers  
Cameron and Cameron, Inc.  
1176 River Road  
Fulton, CA 95439  
707. 546.7706

## Compost

*On Farm Composting Handbook.* [www.nraes.org](http://www.nraes.org)

## Septic Systems

*The Homeowner's Guide to Septic System Operation.*  
Sotoyome Resource Conservation District. 2004.

## CONTRIBUTING DOCUMENTS

The *Stewardship Guide for the Russian River* was adapted from several publications, including:

*Santa Cruz County Stream Care Guide* (2003) County of Santa Cruz Planning Department

*Creek Care: A Guide for Urban Marin Residents* (1997) Marin County Department of Public Works

*Creek Care: A Guide for Rural Landowners and Residents of Petaluma and Sonoma Creek Watersheds* (2001) Southern Sonoma County Resource Conservation District

*Groundwork: A Handbook for Small-Scale Erosion Control in Coastal California* (2nd ed., 2007) Marin Resource Conservation District

*Navarro River Guide to Watershed Care and Restoration* (2005) Mendocino County Resource Conservation District

*Every attempt has been made to assure that the information contained in this publication is accurate.  
The Sonoma Resource Conservation District assumes no responsibility and disclaims any liability for any injury  
or damage resulting from the use or effect of any product or information specified in this publication.*