

Understanding Napa County Watersheds

An Introduction to Riparian Areas

Historically, dense riparian vegetation grew along virtually all of Napa County's streams. However, riparian areas have declined significantly from their former range due to human land use activities. Today they cover a relatively small portion of Napa County's watersheds, but their ecosystem functions are vitally important to maintaining biological diversity, water quality, and water reliability.



What are Riparian Areas?

Riparian areas, also called riparian zones, are vegetated areas, usually forested, that border the banks of rivers, streams, lakes, or other watercourses and waterbodies. They are distinctly different from surrounding lands because of unique soil and vegetation characteristics that are strongly influenced by the presence of water.

Riparian areas are made up of a diverse group of native plants including trees, shrubs, vines, and/or grasses adapted to water rich environments. In an intact riparian area there is a "layering" effect of plant sizes, shapes and ages that promotes wildlife diversity. A mature riparian forest has a low layer of groundcover, an intermediate layer of shrubs and small trees, and a high canopy of trees and vines.

Common native riparian trees in Napa County include big-leaf maple, black walnut, box elder, California bay, California black walnut, California buckeye, Fremont cottonwood, Oregon ash, white and red alder, valley oak, and willow.

Common native understory plants include American dogwood, blue elderberry, California blackberry, California grape, California wild rose, honeysuckle, poison oak, snowberry, stinging nettle, seep-monkey flower, snowberry, swordfern, toyon, and Western spice bush.



A thriving riparian corridor along Kimball Creek, the uppermost creek in the Napa River Watershed and the headwaters of the Napa River.

Did You Know?

- The word "riparian" is derived from the Latin word *ripa* meaning bank or shore.
- In California, it is estimated that over 90% of the riparian and floodplain vegetation that was present historically has been lost to development, land conversion, and channelization projects.
- Riparian woodlands and forests cover about 2% of the total land area of Napa County.
- Riparian areas in the West provide habitat for more species of birds than all other western vegetation combined — 80% of neotropical migrant species (mostly songbirds) depend on riparian areas for nesting or migration.

Signs of a Healthy Watershed

The presence of thriving, healthy riparian areas indicate a healthy, functioning watershed. Healthy riparian areas are well-vegetated with a diversity of native plants over-hanging creek and river channels. Other indications of a healthy area include stable streambanks, well-defined stream channels, and a high diversity and abundance of wildlife. Unhealthy riparian corridors are characterized by sparse vegetation, infestations of invasive plant species, eroded banks, poorly defined stream channels, and/or low wildlife diversity and abundance.



The Value of Riparian Areas

Erosion Control

Riparian vegetation stabilizes streambanks and reduces erosion. Roots hold bank soil together, and stems protect banks by deflecting the cutting action of waves, boat wakes and storm runoff. Native riparian plants tend to grow in patterns that maximize this function. Riparian areas also absorb surface water runoff and slow water velocity, thereby reducing the amount of streambed scour. When plant cover is removed, more surface water reaches the stream, causing the water to crest higher during storms. Stronger flow can scour streambeds and disturb aquatic life.

Flood Control and Groundwater Recharge

Well-vegetated riparian areas help protect people and property from flood damage by slowing and storing flood waters. As floodwater flows through riparian vegetation, the plants resist the flow and dissipate energy, slowing the velocity of runoff and increasing the time available for water to infiltrate the soil and recharge the groundwater supply.

Water Quality Protection

A well-vegetated riparian area prevents pollutants, such as excess sediment and nutrients, from entering waterways by slowing runoff and acting as a filter. The dense matrix of roots and leaf litter traps and filters out the pollutants that could otherwise wash into surface and groundwater. Some pollutants are broken down and incorporated into plants, soil and micro-organisms. Chemical and biological activity in the soil can capture and transform nitrogen and other pollutants into less harmful forms.

Economic Values

Healthy functioning riparian areas help private landowners, local governments, and other public agencies reduce costs associated with water quality and fisheries protection and hazards such as flooding and damages to stream banks. They can also enhance property values by improving the appearance of the stream.

A Home for Wildlife

Healthy riparian areas are among the most productive and resilient wildlife habitats, providing dense vegetation and a high diversity of plant species. This translates into food, cover, and breeding areas for a great variety of wildlife. The drinking water, aquatic insects and fish also provide resources to species that inhabit upland areas. In addition, continuous stretches of riparian corridor serve as critical travel area for wildlife, allowing for free migration between different habitats.

Protection of Aquatic Life

Forested riparian areas benefit aquatic life by improving the quality of nearby waters through shading, filtering, and moderating stream flow. Shade in summer maintains cooler, more even temperatures, especially on small streams. Cooler water holds more oxygen which reduces stress on fish and other aquatic creatures. A few degrees difference in temperature can have a major effect on their survival.

The ability of riparian areas to reduce the amount of fine sediments entering streams also helps protect aquatic habitat. Excessive sedimentation is harmful or fatal to salmonid and aquatic invertebrates. In addition, riparian areas deliver organic debris into streams which provides food for aquatic organisms, an important source of food for fish and birds. Large woody debris, often referred to as LWD, can create pools, and provide cover for fish and their food supply while reducing erosion by slowing flow. LWD is generally considered to be material 12 inches in diameter and at least 10 feet in length.

Recreation & Aesthetics

Healthy, functioning riparian areas add an aesthetic value to landscapes, providing qualities of natural beauty, wildness and privacy. In urban and residential areas, natural streamside vegetation provides visual contrast and relief and buffers the noise from nearby highways. Riparian areas also enhance river and stream environments for recreational uses such as hiking, swimming, fishing, boating, birdwatching, picnicking, and nature study.

Natural Disturbances Shape Riparian Areas



Sandbar willows (*Salix exigua*) thrive in areas subjected to periodic flooding.

Flooding is a natural disturbance that shapes riparian areas. Riparian plant composition, habitat structure and productivity are determined by the timing, duration and frequency of floods.

Riparian plant species are highly adapted to the dynamics of stream flood cycles. During extreme flooding, these forces can sometimes appear devastating, but in most cases, the riparian area recovers rapidly. The most severe flood disturbance occurs in the active channel, which frequently receives high energy flows in winter. The plants in the active channel tend to be particularly adapted to great hydraulic force and are often capable of re-sprouting after being torn up

and re-deposited downstream. Active plants also tend to require large amounts of water, and must tap into the groundwater to survive. Examples of these active channel species include willows, cottonwoods and alders.

Plants found on the floodplain, above the active channel, are less tolerant of flood disturbance and require less water than active channel plants. Examples of these floodplain species include valley oak, big leaf maple, buckeye and California bay laurel. Floodplain areas tend to have many more species than active channel areas, with several types of vegetation, including large canopy trees, shrubs, vines and herbaceous groundcovers. A mature riparian floodplain plant community with multi-layered habitat may require one hundred years or more to develop, while vegetation in the active channel is often only a few years old.

Human Disturbances Threaten Riparian Areas

Natural disturbances usually help build the character of riparian areas and are not considered to have long-lasting adverse impacts. However, human disturbances often do have adverse impacts. The primary threats to riparian areas are hydrologic modifications, land conversion, invasive species, and overgrazing or direct disturbance by livestock.

Hydrologic Modifications

Building dams across channels, constructing levees and channelizing streams significantly alter the movement and storage of water which is important to healthy functioning of the riparian system. Water withdrawals from streams also may reduce water levels, depriving riparian areas of moisture. The construction of road crossings and agricultural and urban development may not directly remove riparian vegetation, but they may increase the rate and volume of surface runoff after rainfall events. This change in surface runoff patterns leads to more intense flooding for shorter duration which alters the composition of riparian areas and reduces productivity.

Land Conversion

The most common human disturbance to riparian areas involves clearing vegetation and converting the area to other uses such as cropland or urban land.

Invasive Plants

Many species of exotic plants, introduced intentionally or unintentionally by humans, are spreading into riparian areas to the detriment of native vegetation. Giant reed (*Arundo donax*),

periwinkle (*Vinca major*), tree of heaven (*Ailanthus altissima*), Himalayan blackberry (*Rubus discolor*) and other invasive weeds are becoming dominant in many riparian areas in Napa County. This shift in riparian species composition reduces native species diversity and habitat value, and alters the hydrology of local streams.



A channelized creek in Napa dominated by Harding grass, a non-native invasive weed.

Livestock Grazing Impacts

Overgrazing concentrates livestock in riparian areas for extended periods, resulting in reduced vegetation and eroded streambanks. Unmanaged livestock access to streams may also lead to trampling of banks and excess animal waste products in receiving waters.

Stewardship of Riparian Areas

If you live along a creek you are in the fortunate position of being able to directly help improve our watersheds through responsible stewardship of riparian areas. Below are several recommendations for managing riparian areas on your property.

- **Preserve existing native riparian vegetation.** Many plants growing within a riparian corridor help to stabilize banks. In times of flooding, a well-vegetated creek may provide your streambank with needed protection. If clearing must occur, leave as many plants as possible and replant with appropriate native plants.
- **Avoid locating structures near creeks.** Locating structures such as decks and storage sheds near creeks often requires removal of riparian vegetation and can decrease the stability of the creek banks. In addition, any structure built within reach of flood water is subject to damage or loss and may decrease the creek's ability to accommodate flood flows.
- **Avoid planting invasive non-native plants.** Non-native invasive plants that particularly threaten riparian areas in Napa County include giant reed, Himalayan blackberry, periwinkle, German and English ivy, black locust, French, Scotch, and Spanish broom, tamarisk, acacia, eucalyptus, and tree of heaven.
- **Remove invasive non-native plants.** If your riparian area is infested with invasive weeds, consider removing them and replant with appropriate native plants species. For assistance contact the Natural Resources Conservation Service (NRCS).
- **Keep an eye on your creek banks.** If you notice bank failures or areas where vegetation has been damaged or removed, you may need to take action to restore your streambank to a healthy condition. Streambank work is often complex and requires several types of permits to protect surrounding areas. It is advisable to contact a qualified resource professional to assist you in planning the repair of your creek bank. Contact the NRCS for assistance.
- **Restrict or control livestock access to creeks.** Livestock and horses can impact riparian areas by destroying plants, trampling creek banks, disturbing wildlife and degrading water quality. Consider seasonal grazing or exclusion of livestock from riparian areas. Avoid building livestock corrals and feeding/watering areas near creeks.

A Word on Width

There is not one generic riparian corridor width that will keep water clean, stabilize creek banks, protect fish and wildlife, and satisfy human demands on the land. In general, larger widths are needed for wildlife habitat than for erosion control and water quality purposes. Widths may range from 35 feet (on smaller streams with slopes less than 15%) to protect water quality to well over 300 feet to protect wildlife habitat. An advisable approach is to base the width on natural features such as slope, presence of wetlands, width of the floodplain, existing condition of the creek, wildlife species of interest, and presence of impervious surfaces.



For more information about the management and restoration of riparian areas, call or visit the:

**Natural Resources
Conservation Service (NRCS) or
Napa County Resource
Conservation District (RCD)**

1303 Jefferson St, Suite 500B, Napa, CA
707/252-4188
www.naparcd.org

A great deal of the NRCS and RCD energy is devoted to assisting landowners with riparian area management and restoration. Technical and financial assistance may be available.

Sources

Napa County RCD. 2005. *Caring for Creeks: Management Tips for Streamside Property Owners in Napa County*. Call the RCD for a free copy.

Napa County Resource Conservation District. 1994. *Napa River Watershed Owner's Manual: An Integrated Resource Management Plan*. Available on the RCD website at www.naparcd.org/publications.htm

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USDA Natural Resources Conservation Service. 1996. *Riparian Areas*. NRCS/RCA Issue Brief 11. This factsheet can be viewed at www.nrcs.usda.gov/technical/land/pubs/ib11text.html

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