

**Caring
for our
Creeks**

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What's this all about?

As residents of Contra Costa County, we are surrounded by creeks. They are a source of enjoyment and a necessity for the wildlife that inhabit the area. We are constantly interacting with our creeks because we share the same land. We plant and remove vegetation, build additions to our properties along the banks, and our children might even play in the creeks during calm days.

Because creeks are such an integral part of our lives, we need to take care of them. Unfortunately, we may sometimes do the wrong things, such as leaving litter and debris in or around the creeks. Likewise, we may hurt the creeks by allowing chemicals to enter them through runoff, either directly or via the storm drains. There are other times when damage to creeks and properties are nobody's fault as when flooding and erosion disrupt our lives.

How do we know the right things to do, and how do we handle the problems we face as creekside property owners? That is what this brochure is all about. The Creekside Owner's Manual will provide you with information on:

- Why creeks flood
- Causes and effects of erosion
- Causes and effects of vegetation loss
- How and why creeks and stormwater should be managed
- Resources that are available to you
- Agency contacts and procedures for property improvements

The information presented in this guide is intended as general educational material and reasonable efforts have been made to provide accurate information.



The Creeks of Contra Costa County

There are basically two types of creeks flowing through Contra Costa County: intermittent and year-round.

Intermittent Creeks

- flow seasonally
- are dry during Summer and Fall
- have a water supply largely from runoff from rain
- may or may not be channelized
- their water flows to sea
- may flood during and after storms

Year-round creeks

- flow year-round
- have a water supply regulated by dams or reservoirs
- may or may not be channelized
- their water flows to sea
- may flood during and after storms

A creek flowing along your property is a valuable amenity. A healthy creek flowing along an owner's property has traditionally increased the value of that property. You and your neighbors share responsibility for keeping the creek and its corridor healthy, both for people's enjoyment and for the wildlife that depend upon the fragile waterway. Since so much of creekside property is in private ownership, much of the responsibility for the health of creeks and the survival of creek-dependent wildlife lies with you, the creekside residents. Mismanagement of the creek can often lead to drainage problems, erosion, property damage and a decrease in property value.

Creekside properties, in most cases, utilize the nominal creek centerline as the property line (despite the perception that a fence at the top of the creek bank defines a property). Ownership of the creekside property carries special responsibilities and risks.

Creek care is everyone's job

As a member of the Clean Water Program, Contra Costa County is committed to maintaining the health of its creeks. This is carried out mainly through the National Pollutant Discharge Elimination System program (NPDES).

The purpose of the NPDES program is to meet the requirements of the Joint NPDES Municipal Stormwater Permit mandated by the State and Federal governments. The mission is to reduce and eliminate pollutants entering the stormwater system, which will enhance the quality of life for residents and preserve riparian (waterway) environments. Best Management Practices have also been established to further ensure that industries and residents maintain a healthy riparian environment.

Creeks are monitored by the respective cities with periodic inspections, and residents are expected to comply with federal and local ordinances. Refer to the ordinance section for more details. Each city may also engage in Public Education programs to promote a clean creek environment. Each city's program may vary. Activities may include public school education, volunteer cleanups and storm drain stenciling. Contact your local agency for specific details.

Although public agencies may inspect the creekside environment, it is especially vital that you also make every effort to keep your creekside clean and stable. Likewise, it is important to consider how your actions, near or in the creeks, will affect your neighbors both upstream and downstream. This will assure that your creeks stay healthy and that your neighbors can enjoy them.



How healthy is your creek?

Signs of a Healthy creek

water quality and flow

- Cool, clear water free of contaminants & algae
- Flowing, non-stagnant water

Symptoms of an Ailing creek

- Excessive algae, sediments, sewage, garbage
- Animal waste, fallen trees, metals or toxins
- Hot water or murky, cloudy water

creek bed and banks

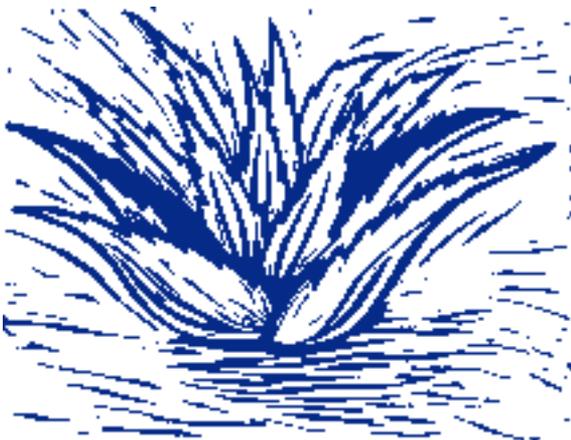
- Stable vegetated banks which may include natural erosion of the creek bank. (Refer to EROSION section for details.)
- Presence of slow pools & fast water

- Excessive erosion along creek banks and high sedimentation, impeding stream flow
- Litter, yard clippings, trash, tires & dumped debris

plants and wildlife

- Native riparian (water-side environment) canopy and vegetation
- Thriving, aquatic organisms (only during times of stream flow)

- Lack of diversity in plants and organisms
- Invading, non-native plants that take over native species in riparian corridor
- Barren creeks
- Diminished or nonexistent organism populations



Who shares the creeks with you?

Typical animals inhabiting the creek environment include newts, frogs, raccoons, skunks, possum, squirrels, and deer. Birds include egrets, herons, red tail hawks, red shouldered hawks, and other species. The proximity of urbanization and the creek will influence the type and extent of a particular species.



Native stream-side plants are also good sources of food and shelter for wildlife. A canopy of overhanging trees and shrubs shades out summer sunlight, keeps water temperatures down, for heat-sensitive organisms, and limits overgrowth of vegetation in the flow region of the creek. A well-vegetated stream can also serve as a travel corridor, helping land animals and birds move safely from one protected area to the next. Typical plant species include willow and coast live oak, intermixed with box elder, elderberry, California Bay, coyote brush, blackberry, and watercress. Poison oak is also common - avoid touching it!

Watch out for erosion!

Soil erosion can be a natural process. In stable watersheds, the rate of erosion is slow, and the natural healing process can keep up with it. Nevertheless, human use of the land has accelerated the rate of change within the watershed, beyond nature's healing capabilities. High flow rates, from an intense rain, can make significant changes in creek banks, despite steps taken to prevent it. This is a risk inherent to all creekside property owners.

Increased volumes of runoff from rain, removal of natural vegetation, and upstream changes of the creek channel may lead to erosion problems on banks that were once stable. Improper construction of decks and structures along the creek bank can also cause the creekside to be unstable. Unstable banks can lead to bank failures and add large volumes of sediment to the creeks. This can lead to the loss of clean creek water and creekside vegetation, and may affect aquatic life. Severe property damage can also result. Therefore, any development near the creek needs to be reviewed by your City or local jurisdiction. Refer to the [RESOURCE](#) section for the agency contacts.

Keep an eye on the bottom of the slope! Native riparian plants, growing within a creek corridor, provide important habitat and help stabilize banks. Replant barren slopes with native plants as quickly as possible (once proper permits have been obtained). In times of flooding, a well-vegetated creek bank may be your property's best protection. Vegetation tends to prevent erosion by:

1. Keeping soil particles in place
2. Filtering soil particles out of runoff
3. Absorbing the force of raindrops
4. Slowing the velocity of runoff
5. Maintaining infiltration
6. Protecting slopes against undercutting & slumping banks
7. Absorbing water

Check for erosion regularly and correct problems promptly. If debris poses a serious flooding or erosion hazard, careful removal is necessary. When flowing water meets unprotected soil, erosion almost always results. Barren slopes on any portion of your property (not just creek banks) can lead to sedimentation problems in the creek. Too much sediment (soil, sand, and fine gravel) fills in the creek bed and reduces its ability to carry flood waters.

On slopes above the waterline that are not too steep, a covering of straw on newly bared earth will prevent erosion until vegetation can grow back. Putting tires or slabs of concrete over the bank will create more erosion and it is a violation of various ordinances.



If you have an erosion problem, consult your City or local agency representatives and a qualified professional in bank stabilization and repair.

Check with your local representative from the California Department of Fish and Game - you may need to obtain a Streambed Alteration Agreement. The State Water Board also requires "401 Certification" for most creek projects. The US Army Corps of Engineers may require a permit for work done in waters under their jurisdiction. City and local flood control agencies also have local creek ordinances with which you must comply. Local, state and federal permit processes are there to help ensure that riparian habitats and creek flows are protected and that property owners do not inadvertently worsen the situation. Remember, these agencies are there to assist you!

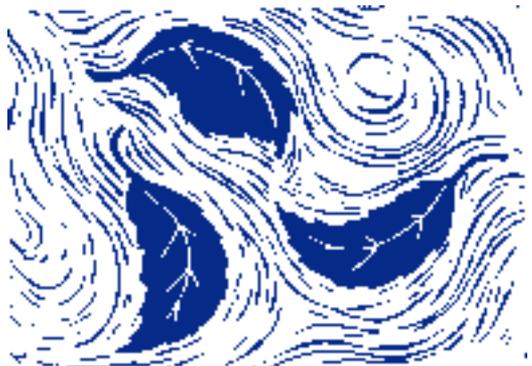
Then there's the flooding....

Rain in Contra Costa County is seasonal in nature. Generally, approximately 90 percent of the rainfall is received from November to April, and as a result of the intense concentration of rainwater, flooding usually occurs during those months.

Runoff upstream is relatively rapid because of steep slopes, while runoff from the flat lowlands is slower because of gentle slopes. This will vary with the amount of soil permeability and ground cover. Runoff flows into streets, collects in storm drains and then discharges to the creeks. Some infiltration occurs, but factors such as topography, development, and impermeable surfaces (surfaces that do not allow the water to pass through, such as streets and parking lots), create runoff in urban areas, which can be relatively high. During peak rainy seasons, the sudden increase in runoff, into the creeks, causes the water level to rise dramatically, and may result in flooding at lower elevations.

Other factors may increase the chance of flooding. Debris, such as garbage, rocks or fallen trees reduces the flow of creek water. High tide can also influence the possibility of flooding within cities near the ocean.

Avoid diverting water or blocking the creek. Water diversions and blockages significantly reduce water flow. The safest approach to good creek care is to avoid changing the creek, unless it is needed to correct a bank problem. Do not dump any debris into the creek. If you do notice any debris within your section of the creek, take time to remove it safely. Refer to RESOURCES for more assistance, if necessary.





Consider the following prevention tips if flooding is expected in your area:

- Have a family disaster supply kit in your home, including plenty of pure water, a first aid kit, a radio, a flashlight, and fresh batteries.
- Be aware of neighbors or relatives who may require help and check on them.
- Buy flood insurance; note the 30-day waiting period.
- Keep gutters, storm drain inlets, driveway culverts and creeks clear and free of debris. If you observe plugging in a public storm drain inlet report it to your City.
- Keep your car fueled.
- Keep sandbags, plywood, plastic sheeting, lumber and other emergency materials handy for waterproofing.

If you do find yourself flooded in your home, here are a few safety tips:

1. Listen to the radio for news about what to do, where to go, or places to avoid.
2. Stay off the roads, but if you must walk or drive, stay on firm ground. Standing water may be electrically charged from power lines. Do not drive through running water.
3. Stay away from creek banks! They may be very unstable!
4. Turn off the electricity at the main breaker or fuse box, even if the power is off in your community.

It may be wise to get a copy of the book *Repairing Your Flooded Home* from the American Red Cross. The booklet contains safety information regarding flood situations. Refer to [RESOURCES](#) for contacts.

What's in the water?

What many people do not realize is that storm drains lead directly to local creeks and into the San Francisco Bay. Unlike the water that runs down your kitchen sink (which connects to the sanitary sewer system), stormwater, and everything it picks up along the way, goes directly to our creeks - with no treatment whatsoever. Pollution, within our creeks, harms the quality of the soil and kills creekside vegetation. It can cause algae to grow, taking away nutrients and oxygen that are vital to other organisms. Lastly, chemicals can harm children who play in the creeks as well as cause odor problems.

Here's a list of good practices in keeping the water clean:

- Never dump gasoline, motor oil, antifreeze, battery acid, or other automotive fluids into a creek or storm drain. Dispose of properly by recycling through your local collection program or recycling depot. Call 1-800-NO-DUMPING for a location near you.
- Use up leftover paints, or share with a friend or neighbor. Dispose of/recycle unusable paints and paint products at your local hazardous waste facility.
- Use water-based latex paints whenever possible and do not clean paint brushes in the gutter, a storm drain or near a creek.
- Never dump carpet cleaning water into a creek or storm drain. Dispose of these solutions down a sink or toilet. Even biodegradable products can harm wildlife, since they can take years to degrade.
- Avoid hosing down paved surfaces or washing your car in the driveway or street. Wash cars on a lawn, unpaved surfaces or at a commercial car wash (where the water is treated and recycled).
- Use cat litter or other absorbent materials to remove spills from paved surfaces.
- Do not place any grass clippings or organic waste (such as animal wastes) on the creek bank, as they upset the ecological balance.
- Do not discharge swimming pool water with active chemicals into the creek or storm drains.
- Do not allow sediment and erosion runoff to flow into the creek.
- Report any illegal dumping to your City Police, City Maintenance Department or local authorities.

Refer to the [RESOURCES](#) and [ORDINANCES](#) sections for a list of who to call.

Creek-friendly construction, gardening & landscaping

During construction or landscaping projects, every precaution should be taken to protect nearby creeks from the effects of erosion. This means:

- Scheduling these projects for late spring or summer months (May through September), when chances of rainfall and erosion are minimal.
- Covering exposed soil with straw, wood fiber, woven straw blankets, landscape fabric or other non-toxic permeable materials.
- Planting fast-growing, native grass seed mixtures or other native plants as temporary ground cover on larger exposed surfaces.
- Constructing a backup system to hold back soil and sediment.
- Keeping stockpiled materials such as topsoil, sand, mulch and bark under wraps and well away from streamsides.

Consult a local nursery, California Native Plant Society, California Exotic Pest Plant Council or the California Department of Fish and Game if you have questions regarding plants to determine acceptable landscaping along your creek.

Examples of these native plants are:

- California Bay Laurel
- Box Elder
- Willow
- White Alder
- Oak
- Blackberry
- Buckeye
- Elderberry
- Big Leaf Maple

Avoid using plants that are considered invasive and encroach into native species, such as:

- Algerian Ivy
- Vinca
- Giant Reed
- Blackwood Acacia
- Eucalyptus
- “Dumb Cane” (Arundo donax)
- Pampas Grass



Consider starting a home composting project and using organic soil amendments instead of chemical fertilizers. Anything that was alive will naturally decompose. However, some organic wastes should not be composted at home. **Do** compost these items: grass clippings, leaves, plant stalks, hedge trimmings, old potting soil, twigs, annual weeds without seed heads, vegetable scraps, coffee filters, and tea bags. **Do not** compost these items: diseased plants, weeds with seed heads, invasive weeds, pet feces, dead animals, bread and grains, meat or fish parts, dairy products, grease, cooking oil, or oily foods.

Avoid irrigating native creekside plants. Watering such species in the summer may encourage exotic and non-native plants to thrive. Native plants are adapted to seasonal rainfall.

Limit use of gardening chemicals. When used incorrectly, pesticides can pollute water and kill beneficial insects, as well as harmful ones. Natural alternatives prevent both of these events from occurring and save you money. Also, consider using plants that naturally repel insects. Pesticides, herbicides and chemical fertilizers should only be used as a last resort. Pull weeds, before they flower, to reduce the need for herbicides. Remember, any fertilizer applied too often, in overly large amounts or during the rainy season, may end up in your creek. If you must use a pesticide, be sure to leave a buffer zone between sprayed areas and streams and avoid application during rainy, wet times when chemicals can readily run-off into the water. Consult your local nursery for advice on proper gardening techniques.

Unfortunately, many people “tidied” their property by removing plants that “cluttered” stream banks. Not only do they set the stage for serious erosion problems, but by choosing to landscape their property with non-native plants, many streamside landowners may have unintentionally edged out helpful natives. Note that fallen logs or displaced tree root balls may provide resting/hiding places for fish; it may be beneficial to leave them in place, if they do not obstruct normal creek flow.

Never dispose of lawn clippings in a creek. While they are biodegradable, organic wastes use the oxygen that aquatic organisms and native plants need to survive. If you have a large amount of waste to dispose of, contact the City or your waste disposal company for disposal instructions.

Building something?

Protect your creek by locating structures and storage containers away from the creek bank. Any structure built within reach of flood waters is subject to damage or loss and may decrease the creek's ability to handle flood flows safely. Structures, such as storage sheds, patios and decks, typically remove the creek's natural protective vegetation and often decrease the stability of vulnerable slopes. Construction disturbs the soil and vegetation, increasing sediment buildup in the creek.

The best way to accommodate flood waters is to avoid constructing improvements in the flood zone and to maintain the area in its natural state. If you do need to construct near the creek, certain procedures and setback ordinances must be followed. Consult your city agency for further details. Here are some typical steps for building a new structure near a creek:

New structures

1. Contact your City's Planning department for zoning requirements.
2. Consult with a qualified registered Engineer to prepare plans for review by your City's Planning, Building & Engineering departments. Submit duplicate copies to State Department of Fish and Game and State Water Board for review.
3. The City reviews plans and returns plans with revisions, if needed.
4. If revisions are needed, your Engineer should make the changes and resubmit the plans.
5. Upon approval, permits are issued with conditions.
6. The City inspects the site during construction and prior to project completion.

Creebank stabilization

1. Hire a qualified, registered Civil Engineer, experienced in the area of proposed design.
2. Discuss plans with the Planning Division of the Community Development Department and the Current Development section of the Engineering and Transportation Department.
3. Have your Engineer prepare plans for project
4. Follow steps 2 - 5 above (New Structures).

Plans should indicate significant natural features and proposed tree species. Contact your City's Planning department for specific plan requirements, including setbacks from top of creek bank.

City Ordinances

- Most cities have stormwater ordinances that limit water discharges, into the streets, gutter and storm drain system, to rain water only.
- Landscape irrigation is normally allowed to discharge to the stormwater system.
- Most cities also have ordinances which require property owners to remove obstructions from the creek (such as fallen trees, which can create dams or alter the natural course of the creek).

California Fish and Game Code

Do not dump materials where it can pass into creeks, the Delta and Bay (fines may be up to \$25,000.00).

Resources that can help you....

Federal and State Agencies

California Department of Fish and Game	(707) 944-5500
California Water Board (Bay Area)	(510) 622-2300
California Dept. Of Water Resources	(916) 323-9544
Urban Streams Restoration Program	(916) 978-4613
U. S. Fish and Wildlife Service	(916) 414-6600
U. S. Army Corps of Engineers	(415) 977-8658
WCC Integrated Waste Management	(510) 215-3125
FEMA Flood Insurance	1-800-427-4661
FEMA Disaster Information Hotline	1-800-525-0321
National Flood Insurance Program Policyholders / Claims	1-800-638-6620

County Agencies

Contra Costa Health Services Department	
Environmental Division (Hazardous Materials)	(925) 646-2286
Contra Costa County Recycling Hotline	1-800-750-4096
Contra Costa County Household Hazardous Waste Collection Facility	1-800-646-1431

City of Concord Agencies

Planning & Economic Development Department	
Planning Division	(925) 671-3152
Engineering & Transportation Department	
Current Development	(925) 671-3127
Stormwater Program Manager	(925) 671-3394
Maintenance Services Department	
Creek Maintenance	(925) 671-3444

Nonprofit Organizations

Urban Creeks Council	(510) 540-6669
California Native Plant Society	(916) 447-2677
San Francisco Estuary Institute	(510) 622-2465
Waterways Restoration Institute	(510) 848-2211
California Exotic Pest Plant Council	(916) 921-5911
American Red Cross Disaster Service	(510) 307-4400
<u>Repairing Your Flooded Home</u> guide	(510) 535-2894

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