

PACIFICA

Creek Care

HOW TO LIVE
AND WORK IN
PACIFICAS
WATERSHEDS



Preface

The San Pedro Creek Watershed Coalition (SPCWC) arose from a convergence of concerns about San Pedro Creek by a wide array of citizens. Flooding and related bank erosion initially dominated the community's awareness of the stream, but the spread of non-native invasive species such as Cape Ivy and Giant reed and the presence of steelhead trout have also drawn the attention of many of creek-side residents. Water pollution is also a growing concern. The San Mateo County Health Department is periodically forced to post the creek mouth as unsafe for human use.

Through scientific assessment of the creek, the SPCWC has worked to provide the community of Pacifica with valuable information about the San Pedro Creek Watershed. Since 1999, we have conducted systematic assessments of the historic and current physical, chemical and biological conditions of the San Pedro Creek Watershed. We have undertaken assessments of the creek's hydrology, geomorphology, land use patterns, vegetation, fishery and fish habitat, and water quality. Pacifica residents, community leaders and city officials can use this information to help restore and maintain the health of San Pedro Creek.

The purpose of **Pacifica Creek Care** is to help local residents better understand the physical and biological processes that exist in our local creeks and watersheds. The guide provides a brief introduction to these processes, tips on how to tell if your creek is healthy, and discusses what you can do to care for your local creeks. It also contains resources for more information regarding creek protection and restoration. We hope you find this creek friendly guide helpful and informative and use it as a tool to further your knowledge and understanding of these valuable resources.

San Pedro Creek Watershed Coalition



"Water is fluid, soft, and yielding. But water will wear away rock, which is rigid and cannot yield. As a rule, whatever is fluid, soft, and yielding will overcome whatever is rigid and hard. This is another paradox: what is soft is strong."

—Lao-Tzu

Pacifica Creek Care

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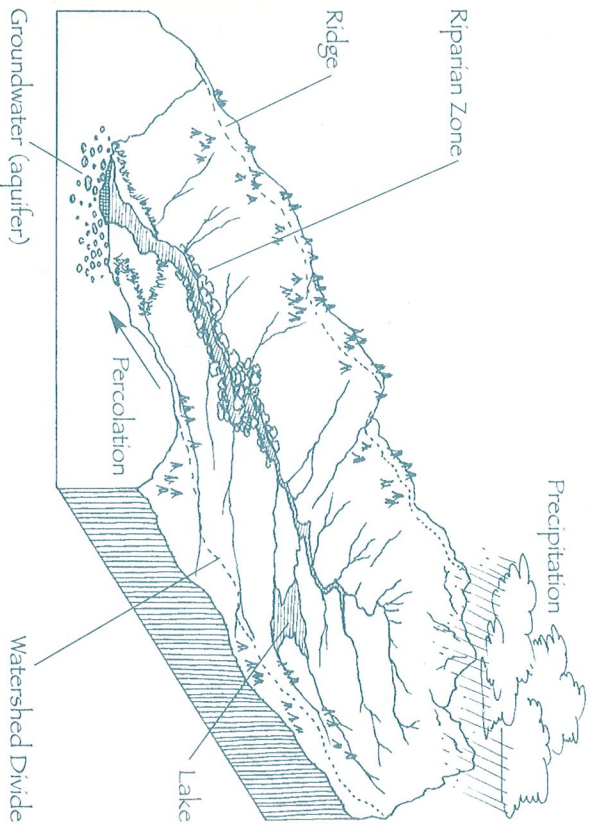
Pacifica Creek Care

What Is A Watershed?

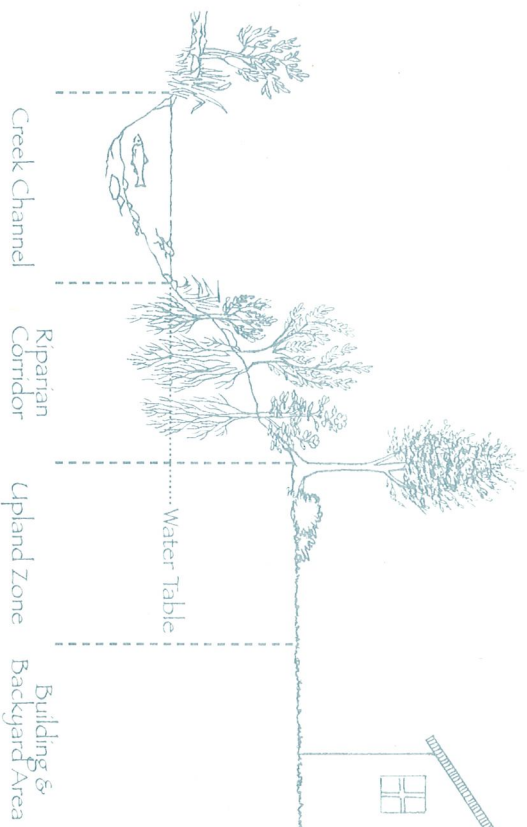
A watershed is all the land drained by a particular creek or river. The watershed catches and stores rainfall, releasing it gradually to the creek. Climate, terrain, soil quality, and plant cover all affect the rate at which stored water makes its way to the creek. In a built-up watershed, impervious surfaces like roofs and pavement prevent rainfall from soaking into the ground so it runs off very quickly.

A watershed functions as an interconnected system, so that natural changes or human activities in one part of a watershed affect other areas downstream. As watersheds change due to natural processes and human activities, these changes can alter water quality, runoff rates, habitat values and erosion processes along the creek and, eventually, have impacts throughout the watershed.

Watershed Anatomy



Creek Zones & Riparian Corridors

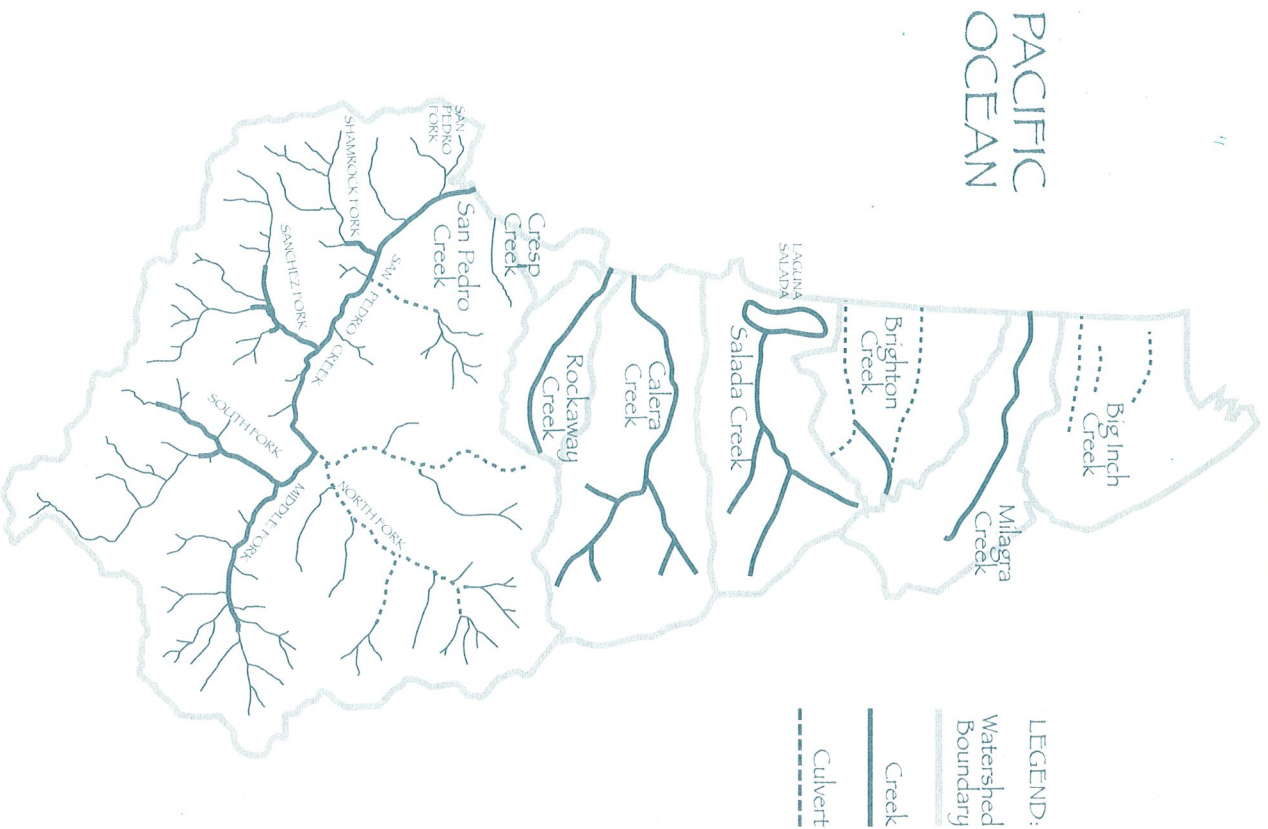


RIPARIAN CORRIDORS

A riparian corridor (or stream corridor) includes an aquatic zone (the creek itself), a riparian zone (a bordering zone of water-loving plants, ranging from a few feet to hundreds of feet in width) and an adjacent upland zone where plant and animal communities are less water-dependent.

Generally speaking, indigenous riparian vegetation is best suited to support the many different kinds of organisms that have co-evolved with these plant species over time. In addition to providing important habitat structure for fish and wildlife communities, native streamside vegetation provides flood control and bank stabilization services that are key to maintaining the geomorphic qualities of the riparian environment as well as providing water retention and flow moderating influences in the upper drainages. In that regard, the introduction of non-native invasive plant species has the potential for seriously degrading both riparian habitat quality and the essential services provided by native watershed plant species.

Pacific's Creeks



San Pedro Creek Watershed

San Pedro Creek is a perennial stream that drains a 5,114 acre basin (8 square miles) in southern Pacifica. The upper reaches of the watershed are drained by the north, middle, and south forks of San Pedro Creek; stream flows are maintained year-round by springs along the south and middle forks. These tributaries come together near the entrance to San Pedro County Park. The main stem then flows northwesterly, paralleling Linda Mar Boulevard, toward the Pacific Ocean.

The upper reaches of San Pedro Creek have healthy riparian areas and winter flows that support migrating steelhead trout. San Pedro is the only creek within 30 miles of San Francisco providing this type of habitat. The most significant physical impacts to the stream come from urbanization in riparian areas, channelization of the lower reaches, and the complete culverting of the North Fork in the 1970's.

THE HISTORY

San Pedro Creek Watershed was once a lush and fertile valley, home to a variety of plant and animal species. A large settlement of native Ohlone lived along the banks of San Pedro Creek; their main encampment, called Puristac, was located in the area that would later become the site of the Sanchez Adobe. In 1782, Spanish explorers and missionaries chose this same site as the location for an asistencia, or agricultural support station. They turned the valley floor into productive fields, growing grains and vegetables to supply the inhabitants of Mission Dolores in San Francisco. This mission was abandoned after

Mexican independence in 1821. San Pedro Creek watershed and the surrounding area were granted to Francisco Sanchez in 1839. Sanchez built his family home on the site of the mission and turned the agricultural valley into a prosperous ranch where he raised his family and lived out his years until his death in 1862.

To settle Sanchez's debts, his rancho was divided among several San Francisco financiers. As they subdivided and sold off the rancho, the San Pedro Creek watershed became a rural agricultural community, supporting truck farms and dairies. By the early twentieth century, it had gained renown as the center of the artichoke industry in the United States.

Construction of the Ocean Shore Railroad between Santa Cruz and San Francisco opened the San Pedro Creek watershed to land speculators, who platted a new community named Pedro Terrace around Tobin Station. The railroad operated weekend excursion trips to lure potential buyers to the valley, but land sales lagged.

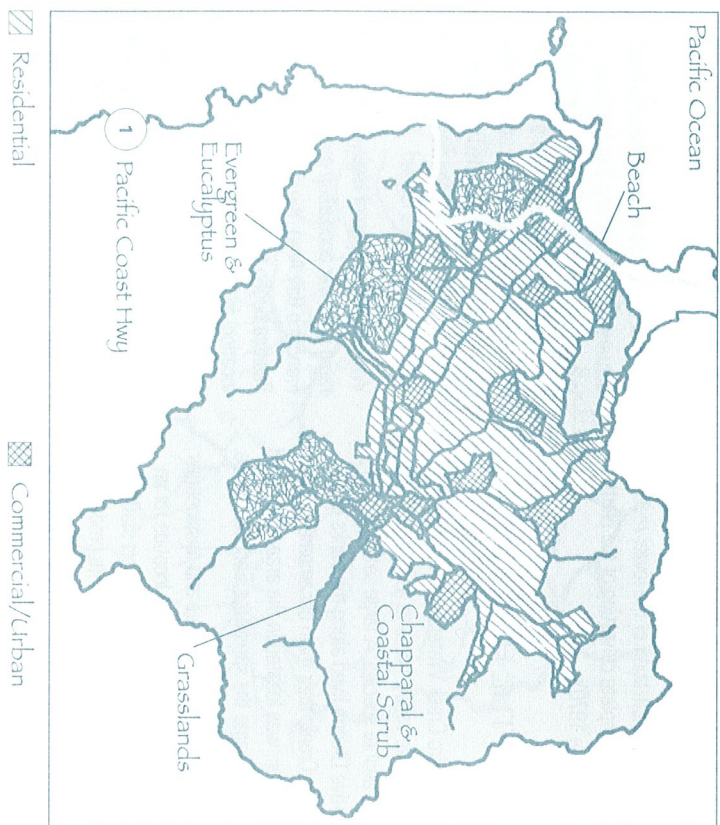
With the completion of Highway 1 and the rapid post-war population growth of the San Francisco Bay Area, the southern portion of Pacifica began to develop as a recreation location. In 1953, a developer named Andy Oddstad built 3,000 homes in the San Pedro Valley, many of them right along the creek. The agricultural land and open space were replaced by homes and streets as the once-quiet and remote watershed was transformed into a densely populated residential community.

LAND USE

Land use in a watershed affects stream dynamics, the behavior of the stream. Where urbanization extends impervious surfaces, less storm water soaks into the ground and more runs off, increasing erosion and delivering more sediment to the creek. Increased sediment load and more frequent peak flows can cause the stream channel to migrate, eroding banks, degrading water quality for fish and wildlife, and increasing the likelihood of flooding.

San Pedro Creek is located in one of the most populous seaside communities in the City of Pacifica. Although its headwaters and most of its south slope remain relatively undisturbed, covered in native shrub and brush, urban land uses dominate the lower hillsides and the valley floor. Land uses in the lower reach include four shopping centers, extensive residential development (the Linda Mar, Sun Valley and Pack Pacifica neighborhoods), several schools and numerous commercial properties, as well as an extensive network of paved roads and parking lots.

Land Use Map



PRECIPITATION AND FLOODING

Annual average precipitation in the San Pedro Creek watershed is 33 inches, ranging from about 23 inches at the Pacific Ocean to more than 38 inches near the eastern ridge line. Nearly all of the rain comes between October and April, bringing a risk of flooding if too much runoff reaches the channel too quickly. San Pedro Creek flows in a deep-cut channel, with a floodplain averaging 35 feet in width. Historically, flooding has been common in the lower reaches of San Pedro Creek. This encouraged the US Army Corps of Engineers to fund the San Pedro Creek Flood Control Project which was constructed in 2001. This newly constructed 10-acre wetland now provides flood water storage, protection for the community, and restored habitat for fish and wildlife.



NATIVE PLANT SPECIES OF SAN PEDRO CREEK

The San Pedro Creek riparian ecosystem contains a variety of California native plant species. These species provide essential habitat for numerous fauna that depend on a healthy and diverse assemblage of species. Below is a list of some of the most common native trees, shrubs, and forbs in the San Pedro Creek ecosystem. The plants listed below are some of the most common native species found in the riparian area.

Scientific Name	Common Name	Scientific Name	Common Name
<i>Alnus rubra</i>	Red alder	<i>Equisetum telmateia</i>	Giant horsetail
<i>Salix lucida</i>	Shining willow	<i>Heracleum lanatum</i>	Cow parsnip
<i>Salix lasiolepis</i>	Arroyo willow	<i>Oenanthhe sarmentosa</i>	Pacific oenanthe
<i>Salix sitchensis</i>	Sitka willow	<i>Marah fabaceus</i>	Valley manroot
<i>Achillea millefolium</i>	Yarrow	<i>Rubus ursinus</i>	California blackberry
<i>Cornus sericea</i>	Creek dogwood	<i>Rhamnus californica</i>	Coffeberry
<i>Iris longipetala</i>	Coast iris	<i>Scirpus microcarpus</i>	Paricled bullrush
<i>Lonicera involucrata</i>	Twinberry	<i>Juncus effusus</i>	Pacific bog rush
<i>Sambucus racemosa</i>	Red elderberry	<i>Juncus lescurei</i>	Salt rush
<i>Scrophularia californica</i>	Bee plant	<i>Juncus patens</i>	Spreading rush
<i>Rubus parviflora</i>	Thimbleberry		

Plants Native to San Pedro Creek



NON-NATIVE INVASIVE PLANTS

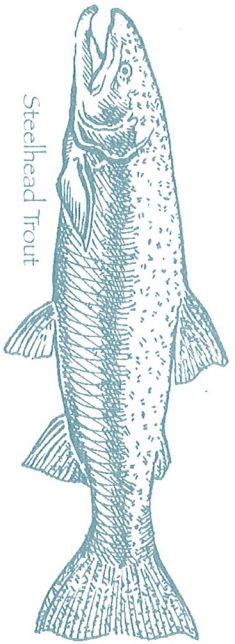
San Pedro Creek also contains numerous non-native invasive plant species that have detrimental effects on California native vegetation and reduce the diversity of the vegetation system. Non-native species are fierce competitors which out compete and displace native plants. These invasive species change the dynamics of the ecosystem and severely degrade the health of the system. Below is a list of the most invasive species in the San Pedro Creek watershed.

Scientific Name	Common Name	Scientific Name	Common Name
<i>Delaria odorata</i>	Cape ivy	<i>Brassica rapa</i>	Wild mustard
<i>Hedera helix</i>	English ivy	<i>Foeniculum vulgare</i>	Fennel
<i>Cortaderia setloana</i>	Pampas grass	<i>Malva parviflora</i>	Mallow
<i>Arrundo donax</i>	Giant reed	<i>Cirsium vulgare</i>	Bull thistle
<i>Conium maculatum</i>	Poison hemlock	<i>Nustrium aquaticum</i>	Watercress
<i>Vinca major</i>	Periwinkle	<i>Euphorbia pepus</i>	Spurge
<i>Raphanus sativa</i>	Wild Radish	<i>Geranium dissectum</i>	Cutleaf geranium
<i>Gerista monspessulana</i>	French broom	<i>Furnaria parviflora</i>	Small flowered funtiorly
<i>Picris echinoides</i>	Bristly Oxtung	<i>Phalaris aquatica</i>	Harding grass
<i>Rubus discolor</i>	Himalaya berry		

Non-Native Plants



ARE THERE FISH IN SAN PEDRO CREEK?



Steelhead Trout

San Pedro Creek is home to a few species of fish, including the prickly sculpin (*Cottus asper*), the three-spined stickleback (*Gasterosteus aculeatus*), and the Pacific lamprey (*Lampetra tridentata*). The most abundant and charismatic species in the stream is the steelhead trout (*Oncorhynchus mykiss*). The steelhead population in San Pedro Creek is part of the south/central California's population of steelhead which is a Federally listed Threatened Species. During the rainy season, it is a remarkable sight to see brightly-colored adult steelhead migrate upstream to spawn, passing right through people's back yards! Steelhead spawn in several stretches of San Pedro Creek, including the main portion of the stream that parallels Linda Mar Boulevard, and the middle and south forks in San Pedro County Park. Young fish will live in the stream for 1 to 2 years then most will depart for the open ocean to mature, where they will live for a year or two before returning to San Pedro Creek to spawn. Unlike species such as Chinook and Coho salmon, adult steelhead may return to sea after breeding and can return several times to spawn, up to 3 or 4 times in their lifetime. Although the upper reaches of San Pedro Creek have healthy riparian areas and winter flows that support migrating steelhead; the lower reaches of the creek have migration barriers which make it difficult in certain flow conditions for fish to reach the prime spawning habitat. Efforts are being made to address these conditions so that steelhead in all life stages can navigate the creek freely.

OTHER FEDERALLY PROTECTED WILDLIFE

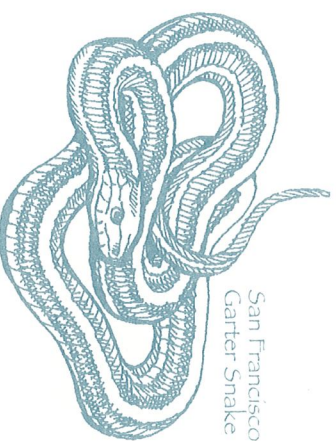
San Pedro Creek provides habitat for at least two other known threatened or endangered species; the California Red-legged frog (*Rana aurora draytonii*), and the San Francisco Garter Snake (*Thamnophis sirtalis tereticaula*).

The California Red-legged Frog is the largest native frog in the western United States and Federally listed as "threatened." Most often found in wetlands, ponds, streams, and lagoons; the California Red-legged Frog is identified by the red color on its belly and hind legs. It also has small black flecks and large dark blotches on its gray, brown, olive, or reddish-brown back.

The San Francisco Garter Snake is a Federally listed and protected "Endangered Species" most often found in wetlands or grasslands, near marshes or ponds that support frog populations. The San Francisco Garter Snake is identified by a broad greenish/yellow stripe, bordered by a thin black line, which runs along the length of its back. These stripes are bordered on both sides by red and black stripes. The top of its head is red and its underside (belly) is blue-green.



California
Red-legged Frog



San Francisco
Garter Snake

COMMON CONCERNS

San Pedro Creek once fed a shallow lagoon and wetland complex called Lake Mathilda. It now flows directly to the Pacific Ocean.

Cattle ranching, farming and urbanization have increased rates of sediment supply and the runoff from the watershed. Bank erosion and flooding have caused property damage and economic loss to the community. Much of the watershed's surface area is covered by impervious materials, and more than four miles of tributary channels have been put into underground culverts.

Runoff, flood magnitude, and flood frequency have all increased as a response to changing land uses in the watershed. The creek has become deeply entrenched, eroding vertically as much as sixteen feet in some areas, and has lost access to its historic floodplain. The water table elevation beneath the valley floor has been lowered due to the entrenched channel, threatening riparian ecosystems and exacerbating bank erosion.

The storm drain system in Pacifica has also negatively impacted the environment of San Pedro Creek. Many of the storm drains discharge directly into the creek and straight into the ocean without treatment of any kind. Motor oil, antifreeze, discarded paints and pesticides, weed killers and fertilizers are all washed into the creek with runoff from rainfall.

Pollutants can make creek wildlife sick and, when they reach the ocean, they can irritate beachgoers' skin and cause intestinal distress. Other debris that finds its way to the gutters – water bottles, spent fireworks, lost toys, yard waste and animal feces – wind up in the creek as well.

Water quality testing shows that San Pedro

Creek is polluted with fecal bacteria such as *Escherichia coli* (E. coli). High levels of fecal bacteria can cause closures at Pacifica State Beach. These bacteria develop naturally in the intestine of humans and warm-blooded animals, and in high concentrations can pose a health risk to the public. Surfers and children playing in the creek have become ill after contact with contaminated water.

The San Francisco Regional Water Quality Control Board's Basin Plan identifies six beneficial uses for San Pedro Creek, including Cold Freshwater Habitat, Fish Migration, Municipal and Domestic Supply, Non-contact Water Recreation, Fish Spawning, and Warm Freshwater Habitat. These uses set maximum values for fecal coliform bacteria levels. Weekly water sampling at the mouth of San Pedro Creek show us that the water quality of San Pedro Creek often exceeds State of California standards and EPA criteria during high flow conditions. The following website provides information on recent water quality conditions at Pacifica State Beach: <http://www.earth911.org/waterquality>.

Another common concern is the habitat for steelhead. The area for suitable habitat for steelhead has declined since the North Fork was developed. In the remaining portions of the stream, migration barriers at bridges and old dams may limit the movements of steelhead under some conditions. In addition, sedimentation and erosion have covered up the gravel beds that steelhead use for nests and fill in pools that young steelhead live in during the two years before they migrate to sea. Finally, pollution can harm steelhead and other residents of the creek. Antifreeze, motor oil, and chlorinated water are common pollutants.

How to Tell if Your Creek is Healthy

San Pedro Creek has been channelized, diverted and subjected to sewage leaks, reduced flows and dumping. Yet intact creek ecosystems continue to thrive in some places, providing habitat for plants and animals and enjoyment for creek side residents and visitors. How can you tell if your creek is healthy?

Signs of a healthy creek include:

- Cool, clear, clean water free of contaminants and excess algae
- Varied flow cycles
- Stable vegetated banks with minimal erosion
- Presence of both slow pools and riffles (fast water running over shallow, rocky stretches)
- Abundant rock and gravel of various sizes (for fish spawning)

Signs of an ailing creek include:

- Poor water quality, including problems such as excessive algae, mud, contamination from animal waste or sewage, heavy metals or other toxics
- High water temperature
- Reduced water flow
- Loss of natural creek channel
- Excessive erosion along creek banks, deeply incised stream bed, or high rates of sedimentation
- Still water, few pools or riffles, absence of clean gravel
- Litter, yard clippings, trash or debris
- Lack of diversity in flora and fauna
- Barren creek banks
- Invasive non-native plants crowding native species out of the riparian corridor
- Few fish, amphibians or aquatic insects
- Abundant native vegetation, providing cover for wildlife as well as root systems which stabilize banks
- Thriving fish, amphibian and aquatic insect populations
- Leaves, small branches, fallen logs and other natural vegetative debris within the stream bed and along the banks, to support the aquatic food chain and provide hiding places for fish and invertebrates.

The Value of Creek Restoration

A stream is more than just a channel that conducts rainwater to the sea. It's a complex, diverse living system of plants and animals. It also serves as a conduit for flood water, replenishes surface and groundwater, and supports all sorts of recreational and aesthetic benefits.

Since the great majority of streamside property in Pacifica is privately owned, much of the responsibility for creek care and restoration lies with streamside residents. Proper management of streamside property and mindful creek restoration yields great benefits, minimizing erosion, protecting water quality, contributing to the survival of fish and wildlife, reducing flood damage, and enhancing recreational opportunities and property values along the creek.

The City of Pacifica has engaged in the following projects intended to improve water quality at Pacifica State Beach and in San Pedro Creek, and to ensure that these waters meet bacteriological standards set forth by the State of California:

- Construction of stormwater treatment wetlands on the west side of Highway 1 extending from Crespi Drive to Linda Mar Blvd.
- Construction of a 10-acre flood control project/wetland adjacent to the Linda Mar Shopping Center.
- Construction of approximately 6 acres of new wetlands and riparian areas along San Pedro Creek, at the creek mouth and near the Capistrano Bridge.

Additional restoration projects include:

- Improvements to sewer lines to eliminate leaks at the mouth of San Pedro Creek and along San Pedro Creek.
- Diversion of storm drainage from the lower Linda Mar neighborhood to the stormwater treatment wetlands on the west side of Highway 1 extending from Crespi Drive to Linda Mar Blvd.

How to Care for the Creek and Maintain Water Quality

Winter rains can bring new life to streams and coastal habitats — or stormwater runoff can deliver load after load of pollution. Our creeks begin in our driveways and front yards. Rainfall and runoff from lawn watering carry pollutants from lawns, streets, sidewalks, roofs and parking lots straight to our creeks and oceans. Don't pollute a creek without intending to.

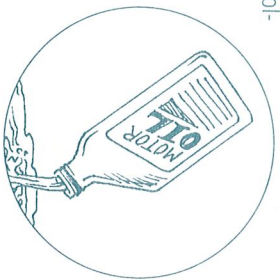
Remember:
"Only rain down the storm drain."

Storm Drain and Creek No-Nos



VEHICLE CARE

- Just one quart of motor oil contaminates 250,000 gallons of water. If you change your motor oil at home, take the used oil to Coastside Scavenger Recycling on Palmetto Blvd or contact **1-800-CLEANUP** to find a used oil collection center.
- Promptly fix any oil leaks from your car, and keep your car tuned-up.
- Don't drain your radiator onto your driveway or in the gutter. Antifreeze is highly poisonous.
- Use a commercial car wash – preferably one that recycles water.
- If you wash your car at home, wash it on gravel, grass or another permeable surface that will collect the soap. Use a hose nozzle that turns off automatically, and only use biodegradable soap.
- Block off the storm-drain during charity car wash events, or use an insert to catch wash water. Pump soapy water from car washes into a sanitary sewer drain. If this is not feasible, spread wash water onto grass or landscaping to provide filtration.
- Businesses with their own vehicle washing facilities should incorporate Best Management Practices (BMPs) to control water quality impacts. Wash vehicles only in areas designed to collect and hold the wash and rinse water. Pressure cleaning and steam cleaning should be done off-site to avoid generating runoff with high pollutant concentrations. Map on-site storm drain locations to avoid discharges to the storm drain system, and immediately contain and treat spills.



HOME CARE AND CONSTRUCTION

Plastic, aluminum cans and other recyclables last virtually forever. If they blow into the gutters, they wind up in the creek. Not only do they make for an ugly landscape, they also choke or strangle sea creatures, fish and birds.

- Minimize your plastic and aluminum purchases (buy in bulk, select brands with minimal packaging) and dispose of recyclables carefully.
- Cover outdoor trash cans securely to help keep storm drains clean and clear of debris.

Construction or remodeling waste can also alter the creek's health or its appearance.

- Dispose of leftover paints and construction debris at a designated household toxic waste disposal site. For more information about where to dispose of specific materials, call the **Household Hazard Waste Hotline at 650-363-4718**. When you work with concrete, cement or mortar, prevent material from blowing or flowing to a driveway, street or drain. Never rinse out concrete mixing or paint containers on your driveway.

Cleanup efforts can send debris and pollutants to the creek.

- Use a broom instead of a hose to clean your driveway or patio. Dispose of leaves in the Green Waste bin, and spread any loose dirt in garden beds. If you must use a hose, use a nozzle that turns off when not in use.
- Getting your deck, patio or outdoor furniture ready for another season? Remember that all types of soap are toxic to fish, and some cause ugly foam or scum on the creek as well. Please wash outdoor furniture on the lawn. A plain-water rinse removes most dust and dirt, and is better for the finish. If you must use soap, use as little as possible and dispose of the wash water in a utility sink, not the driveway, gutter or storm drain.
- Draining a pool or hot tub? Remember that highly chlorinated water kills fish. Discharge pool or hot tub water into the City sewer system and not into the gutters or storm drains.
- Run a neighborhood cleanup campaign. Talk with your friends, family and neighbors about any debris problems.



YARD CARE

Fertilizers, weed killers and pesticides are commonly toxic to fish, birds, and helpful insects. Excess nutrients from commercial fertilizers can cause algae to flourish in creeks. When the algae die, they sink to the bottom and decompose, depleting the oxygen in the water. Fish and other aquatic organisms can't survive in water with low dissolved oxygen levels.

- Use fertilizers sparingly or not at all.
- Learn to use Integrated Pest Management (IPM) to reduce your dependence on harmful pesticides.
- Don't apply outdoor chemicals during the rainy season, especially if rain is forecast.

Yard waste can clog streams and reduce oxygen levels, harming aquatic life.

- Sweep driveways and sidewalks instead of using a hose. Excessive amount of leaves and lawn clippings deplete the creek's oxygen as they decompose. This can cause odor problems, and is not healthy for wildlife.
- Use a broom, not a hose or leaf blower, to clean up your garden clippings.
- Start a compost pile or save yard waste in a water-proof container for Green Waste Pickup.



Paved surfaces like sidewalks, parking lots, roads, and driveways

prevent water from percolating into the ground. A typical city block generates more than five times as much runoff as a wooded area the same size. Heavy storm runoff blasts out stream banks, damaging streamside vegetation and threatening streamside properties. Paved surfaces also transfer heat to runoff, thereby increasing the temperature of receiving waters. This is detrimental to native species of fish and other aquatic life.

- Porous pavement materials can help driveways and patios absorb rainfall more effectively. Wooden decks, gravel or brick paths, and rock gardens keep the natural ground cover intact and allow rainwater to slowly seep into the ground. For some inspired ideas on protecting watersheds through site design techniques, go to www.lowimpactdevelopment.org.
- Grasses or natural ground covers can be attractive and practical substitutes for asphalt driveways, walkways, and patios.

Sediment can cloud water and make it difficult or impossible for aquatic plants to grow. Sediment can also harm fish and other aquatic life. Remodeling? Re-landscaping? Lack of attention to erosion controls can cause excessive sedimentation and damage local streams.

- Divert storm water away from disturbed or exposed outdoor areas and install silt fences or other sediment and erosion controls.
- Re-seed and mulch bare areas as soon as possible. For some more inspired ideas on protecting watersheds through site design techniques, go to www.lowimpactdevelopment.org.

Plant Selection is important, too. Altering the natural contours of your yard and planting non-native plants that need fertilizer and extra water can increase runoff volumes, increase erosion, and introduce chemicals into the path of runoff.

- Xeriscape landscaping incorporates many environmental factors into landscape design—soil type, use of native plants, practical turf areas, proper irrigation, mulches, and appropriate maintenance schedules.
- Using native plants well-suited to the region's climate and pests drastically reduces the need for irrigation, fertilizers and pesticide applications. Less irrigation results in less runoff, while less chemical application keeps runoff clean.
- Native plants also provide food, habitat, and shelter for native insects, birds and mammals.

Hard structures that are used to stabilize banks and prevent erosion can actually reduce the creek's ability to transport flood waters and sediment, causing more damage and accelerating erosion. Riprap (boulders) and concrete increase erosion of adjacent and opposite streambanks, and degrades habitat.

- Tree roots are stronger than concrete. Soil bioengineering methods offer a less expensive, more attractive and more effective means of bank stabilization.
- If you must install bank control structures of any kind, be advised that the California Department of Fish and Game (DFG) requires a Streambed Alteration Agreement for projects that will divert or obstruct the natural flow of water, or change the bed, channel or bank of any stream. Contact the DFG at 707-944-5520 or 707-944-5500.

SOIL BIOENGINEERING

(Planting techniques using Native Willows, Dogwoods or Alders)

Soil bioengineering is the use of plant-based systems for immediate and long-term slope protection and restoration. When applied appropriately, planted roots hold soil particles in place and unlike concrete will continue to root as the creek channel shifts over time. Soil bioengineering is cost effective because live cuttings can be salvaged from nearby trees during plant dormancy (late fall to early spring).

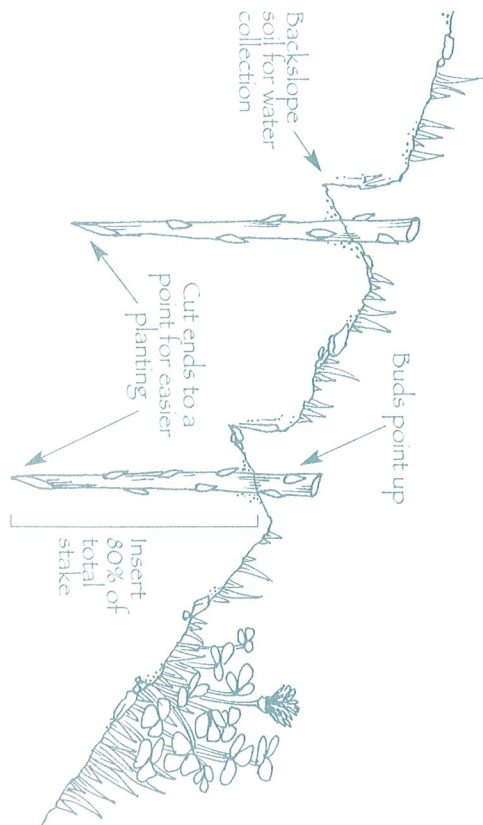
Fascines: Eight- to ten-foot-long bundles of tightly wound dormant willow, dogwood or alder cuttings used for toe or bank protection.

Brush Mattress: Dormant cuttings placed perpendicular to creek flows and staked with willow poles. Twine is woven between and around the willow poles. A Brush Mattress will help collect sediment and act as structural stream bank protection.

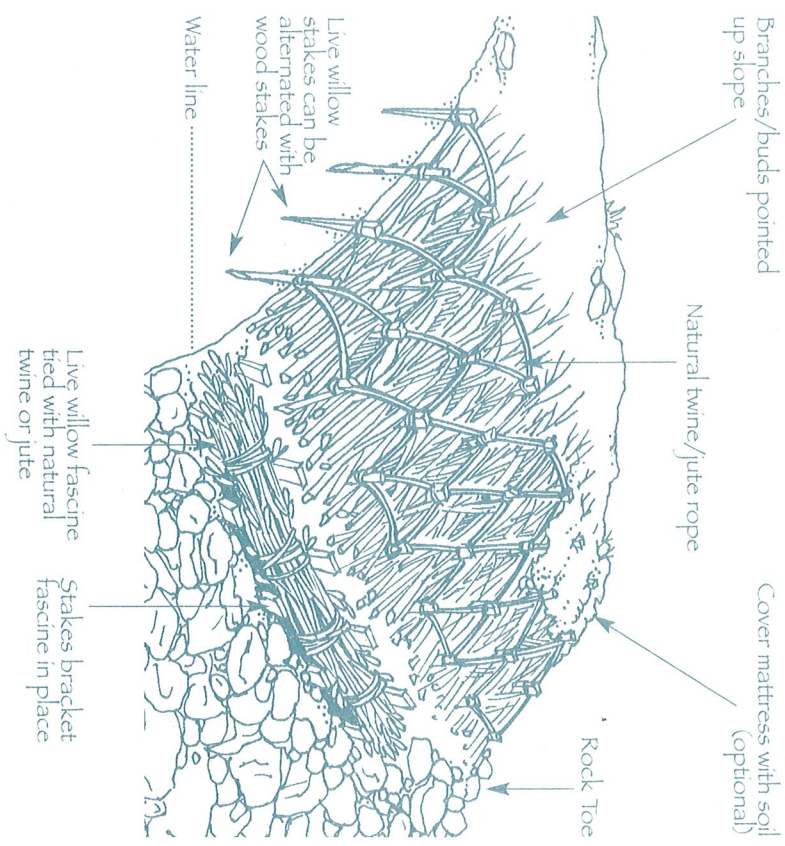
Pole Cuttings: Intended for development of root mass. Pole cuttings are not a short-term solution to slope instability but will soon become trees which stabilize banks and provide native habitat.

**Be aware that soil bioengineering is not appropriate for all sites and conditions. You should consult with a professional before the application of any soil bioengineering technique.*

Live Willow Staking



Brush Mattress



PET CARE

Pet waste is one of the leading pollutants in our creek. Fecal coliform bacteria in the creek can sicken surfers and beach-goers. Domestic cats also harbor a parasite, *Toxoplasma gondii*, that can be fatal to California sea otters.

- Pick up animal waste; wrap it and dispose of it in the garbage can, or flush it down the toilet. Do this when you walk your dog on the beach, too; dog feces contaminate water in the surf zone.
- Even if you use a “flushable” or compostable cat litter, dispose of used litter and clumps in a plastic bag, tied tightly, in the garbage can. The sanitary landfill where your garbage goes is covered and lined to contain all runoff.
- Keep your cats indoors. If they’re carriers of the *T. gondii* parasite, this will help prevent its spread. If they are not carriers, this will help prevent them from acquiring the parasite. For more information, go to <http://cats.about.com/cs/parasiticdisease/a/seaothers.htm#b>

CARING FOR OUR PARKS AND BEACHES

Cigarette filters are made of plastic. They are very durable. When fish and birds eat them, the filters stay in their stomachs. The animals feel full, but they will eventually starve.

- If you smoke while working or playing outside, dispose of cigarette filters in ashtrays or garbage cans, or keep the butts to discard later in the trash.

Trash and Recyclables can clog storm drains and waterways, increasing the risk of flooding. Bottle caps, plastic bags or other debris can also choke animals that are looking for food.

- When you’re engaged in outdoor activities, whether at the beach or at a park, look around for trash cans or recycling bins.
- Never place trash in an overflowing trash can.
- If the bins are inadequate, tell the facility’s caretakers.
- Leave the beach cleaner than you found it — bring along a garbage bag and do a mini-beach cleanup. Pick up trash even if it’s not yours.
- Clean up a local beach. The Coastal Commission organizes a year-round beach cleanup program called “Adopt-A-Beach.” You can get more information by calling (800) Coast-4U or emailing coast4u@coastal.ca.gov.
- Volunteer for one of the many non-profit groups that are working to protect our coast, ocean, and waterways. You can find a list of these groups on the Coastal Commission’s website, in the “Marine, Coastal & Watershed Resource Directory,” at www.coastforyou.org.

Creek Protection

Ever wonder what other communities are doing to protect their rivers and creeks? The Natural Resources Defense Council has developed a fascinating interactive website to explore some of the most effective strategies that communities are using to control runoff pollution. Check it out at www.nrdc.org/water/pollution/storm/stoinx.asp.

TIPS FOR PROTECTING CREEKS, BANKS, AND CRITTERS

- Avoid building structures such as decks or sheds next to creek banks. Check with your building department for specific requirements.
- Leave rocks and woody debris in the creek. They are home to many critters and provide shelter from predators.
- Landscape banks with native riparian plants species. This will help attract native wildlife and restore natural habitat. Leave existing native plants on the banks. They help to maintain cool water temperatures and keep creek banks stable.
- Avoid grading banks or leaving soil exposed during the winter. Use proper sediment and erosion control materials and plant fast growing native ground cover. Fine sediments and mud from erosion covers fish eggs and clogs fish gills robbing them of precious oxygen.
- Store manure or animal waste only in areas where runoff can not enter the creek.



CREEK PROTECTION AGENCIES AND ENTITIES

The City of Pacifica regulates some activities that harm the watershed or the creek, including stacking/storage of organic or synthetic materials (e.g. wood, wood chips, tree trimmings or cuttings, tires, automobiles or other mechanical parts, junk, debris, or salvage materials) adjacent to any creek, stream, canal or other waterway. City ordinances also prohibit throwing or depositing materials into any creek or channel, as well as the discharge of any material other than stormwater into the city storm sewer system. Check with your local Planning and Building Department.

San Mateo County Environmental Health Division
(650) 363-4305 or 363-4708

Handles complaints of hazardous or non-hazardous spills or pollution incidents.

California Department of Fish and Game
(707) 944-5512

Responds to illegal dumping in the creek, fish kills, poaching, etc. www.dfg.ca.gov

San Francisco Bay Regional Water Quality Control Board
(510) 622-2300

Responds to off-site sediment discharges, from construction sites, as well as intentional pollution of the creek. www.waterboards.ca.gov/sanfranciscobay

NOAA Fisheries/National Marine Fisheries Service
www.nmfs.noaa.gov

The agency protects and manages Pacific salmon and their habitats under the Endangered Species Act (ESA) and other Federal laws.

United States Fish and Wildlife Service (USFWS)
www.fws.gov

The USFWS shares responsibility with NOAA for administration of the Endangered Species Act.

Resource Directory

TECHNICAL ASSISTANCE

**The San Pedro Creek
Watershed Coalition**
www.pedrocreek.org

Contact at pedro@hex.com. The Coalition is a nonprofit 501(c)(3) organization dedicated to protecting, enhancing, and maintaining the health of San Pedro Creek and its watershed through monitoring, restoration, adaptive management programs and education. The San Pedro Creek Watershed Coalition welcomes your membership, contributions and/or volunteer efforts.

**San Mateo County Resource
Conservation District**
(650) 712-7765
625 Miramontes Street, Suite 103
Half Moon Bay, CA 94019
<http://www.sanmateorcd.org>

The SMC RCD is a non-regulatory, local agency that partners with willing landowners to improve soil, water, species and other natural resources on their property in a proactive manner.

**San Mateo County Parks
and Recreation**
(650) 363-4021
455 County Center, 4th Floor, Redwood City, CA 94063-1646
www.eparks.net/smc/department/esa/home/0,,5556687_5557733,00.html

The San Mateo County park system provides numerous opportunities to experience and observe creeks and riparian ecosystems in San Mateo County.

San Pedro Valley County Park
(650) 363-4021

Located in Pacifica, this 1,150-acre park has three fresh-water creeks which flow year round: the South and Middle Forks of the San Pedro Creek and Brooks Creek. The South and Middle Forks are of particular significance because they provide some of the few remaining spawning areas for migratory Steelhead trout in San Mateo County.

Urban Creeks Council
(510) 540-6669
1250 Addison St., #107-C
Berkeley, CA 94702
www.urbancreeks.org

The Urban Creeks Council of California is a statewide non-profit organization working to preserve, protect, and restore urban streams and their riparian habitat. They act as advocates on behalf of creeks in urban and other areas, and offer support and technical advice to creeks groups and private landowners.

California Native Plant Society
(916) 447-2677
2707 K Street, Suite 1
Sacramento, CA 95816-5113
www.cnps.org

The California Native Plant Society is a non-profit organization which provides information on California's native flora. They also coordinate educational and conservation projects, host field trips, and hold native plants sales.

The Watershed Project
(510) 665-3546

www.thewatershedproject.org

The Watershed Project promotes the understanding and appreciation of Bay Area watersheds through educational programs and publications.

The Center for

Watershed Protection

www.cwmp.org

The Center for Watershed Protection is a non-profit organization providing governments, activists, and watershed groups with the technical tools for protecting our nation's waterways.

Go Native Nursery

www.gonativenursery.com

Go Native Nursery is an ecological restoration company specializing in California native plants, landscape design and installation, irrigation design and installation, sediment and erosion control installation, and invasive exotic removal and control. Their contract and wholesale Native Plant Nursery propagates coastal shrub scrub and wetland/riparian plants.

PUBLICATIONS

**Restoring Streams in Cities:
A Guide for Planners,
Policymakers and Citizens**

Written by Ann L. Riley.

Available at: www.islandpress.org

**San Pedro Creek Watershed
Assessment & Enhancement Plan**

Prepared by the San Pedro Creek Watershed Coalition.

Available at:

<http://pedro creek.org/research.html>

The Weed Workers Handbook

Published by the Watershed Project and the California Invasive Plant Council, the Weed Workers' Handbook explains how to remove more than 35 of the San Francisco Bay Area's most invasive plants.

Available at:

www.cal-ipc.org/www_handbook

The Practical Stream Bank

Bioengineering Guide

Prepared by Gary Bentrup, J. Chris Hoag, and the Interagency Riparian/Wetland Project.

Available at:

www.elkhornsloughctip.org/reference/subissue_detail.php?SUBISSUE_ID=31

Stream Corridor

Restoration Handbook

An excellent, comprehensive technical resource developed by several federal agencies. Contains restoration technology applicable for streams in both urban and rural settings.

Available at:

www.nrcs.usda.gov/technical/stream_restoration

WEBSITES

California Invasive Plant Council

www.cal-ipc.org

Cal-IPC proposes and facilitates solutions to problems caused by invasive plants. It is an authoritative source of information on all aspects of wildland weed management in California.

**California Native Plant Link
Exchange**

www.cnpix.info/index.html

A collection of links to websites with information about California native plants, indexed by scientific name. You can also find which nurseries carry the plants you're looking for.

CalPhotos

elib.cs.berkeley.edu/photos/flora/

An online database of 33,312 photos, mostly California plants, from Brousseau, the Cal. Academy, and others.

California Watershed Network

www.watershednetwork.org

CWN works to develop a coordinated network of community-based watershed management in California. A great site for keeping up on watershed related events and resources.

Earth 911

www.earth911.org/master.asp

An online resource for local information about water quality and the recycling of household products and hazardous wastes.

Elkhorn Slough

www.elkhornsloughctip.org

www.elkhornsloughctip.org

The Coastal Training Program facilitates the exchange of scientific information on local and regional issues of habitat management, sustainable agriculture, clean water, eco-tourism, and invasive species. The program conducts seminars to bring together farmers, fishermen, regulatory personnel, elected officials, landowners, and scientists to define issues and explore solutions.

Integrated Pest Management
www.ipm.ucdavis.edu

The University of California Statewide Integrated Pest Management Program (UC IPM) develops and promotes the use of integrated, ecologically sound pest management programs in California.

Salmonid Restoration Federation

www.calsalmon.org

The Salmonid Restoration Foundation works to improve the effectiveness of California's salmonid restoration efforts and develop the public and political support that is essential for maintaining and expanding restoration program efforts.

SPAWN: Salmon Protection

www.spawnusa.org

SPAWN works to protect endangered salmon in the Lagunitas Watershed. They conduct habitat restoration, policy development, research and monitoring, citizen training, environmental education, and collaboration with other organizations and agencies.

Surfider Foundation

[San Mateo County Chapter](http://www.surfidermc.org/Portal/)
www.surfidermc.org/Portal/

Their Blue Water Task Force and water testing program strives to improve the quality of the water flowing from our coastal streams while other efforts aim to maintain and expand public access to our local surf breaks.

**San Mateo County Stormwater
Pollution Prevention Program
(STOPPP)**

www.flowstoday.org

A program that partners with San Mateo County residents and businesses to prevent pollution of local water bodies; such as creeks, the San Francisco Bay and the Pacific Ocean. Provides resources on Integrated Pest Management (IPM) and residential and business water pollution prevention.

**NATIVE PLANT NURSERIES
AND SEED COMPANIES**

Albright Seed Company

(925) 372-8245
189 Arthur Road, Martinez, CA 94553
www.albrightseed.com

Bulk sales grass, wildflower,
shrub and tree seed, 50% native;
\$25 minimum order.

Berkeley Horticultural Nursery

(510) 526-4704
1310 McGee Avenue
Berkeley, CA 94703
www.berkeleyhort.com

Retail plants - one section devoted
to natives.

Capitol Wholesale Nursery, Inc.

(408) 239-0589
2938 Everdale Drive
San Jose, CA 95148
cwnsales@stbglobal.net

Wholesale, retail and broker nursery
that emphasizes sustainable land-
scapes.

Central Coast Wilds

(831) 459-0655
114 Liberty Street
Santa Cruz, CA 95060
www.centralcoastwilds.com

State registered organic nursery that pro-
vides quality native plants, seeds, and
services to landscapers and designers.

Elkhorn Native Plant Nursery

(831) 763-1207
P.O. Box 270, 19578 Hwy 1
Moss Landing, CA 95039
www.elkhornnursery.com

Wholesale and retail on Wednesday
and Saturday, seed, container and bare-
root plants, contract collect and grow,
demonstration garden.

Larner Seeds

P.O. Box 407, Bolinas, CA 94924
www.larnerseeds.com

Mail order seeds, retail plants at
nursery October thru July, coastal
ecotypes, wildflowers, perennials,
shrubs, trees, and grasses, contract
collect and grow, demonstration garden.

Native Here Nursery

(510) 549-0211
101 Golf Course Drive
Tilden Regional Park
Berkeley, CA 94708
www.ebcnps.org/NativeHereHome.htm

Volunteer-run by CNPS, excellent
source of locally native plants,
revegetation, and restoration.
Open Friday and Saturday, call ahead.

O'Donnell's Fairfax Nursery

(415) 453-0372
1700 Sir Francis Drake Boulevard
Fairfax, CA 94930

Retail and wholesale organic native
nursery specializing in Californian native
habitat restoration.

The Watershed Nursery

(510) 548-4714
155 Tamalpais Rd
Berkeley, CA 94708
www.TheWatershedNursery.com

Grows a wide variety of plants providing
for a high degree of native plant/habitat
biodiversity.

Yerba Buena Nursery

(650) 851-1668
19500 Skyline Blvd.
Woodside, CA 94062
www.yerbabuenanursery.com

Retail plants and some seed, large
demonstration garden with mature
examples of many cultivar and species
natives. Except for ferns, all native.

EROSION CONTROL

MATERIALS

ATCO

(925) 666-4430
4025 Nelson Ave.
Concord, CA 94520-1215

Reed and Graham

(408) 947-4294 or 1-800-446-2560
690 Sunol St., San Jose, CA 95126

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tion purposes only. Every effort was
made to provide appropriate, accurate
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specific advice or guidance, check with
your local Planning and Building
Department and contact a licensed or
knowledgeable professional.

PACIFICA
Creek Care
HOW TO LIVE AND WORK IN
PACIFICA'S WATERSHEDS



by
San Pedro Creek Watershed Coalition

A nonprofit 501(c)(3) organization dedicated to protecting,
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