

Creek Chronicles

Friends of Corte Madera Creek Watershed

Volume 16, No. 2

July–December 2011

Flood Protection and Watershed Program Update

The Ross Valley Flood Protection and Watershed Program is moving forward. The Capital Improvement Plan Study Report, which identifies a number of actions to meet the program’s objectives, was presented at a meeting of the Flood Zone 9 Advisory Committee meeting on May 23, 2011.

The program has three major components, each of which includes both flood reduction and habitat enhancement measures: 1) detention basins to reduce peak flow during flood events, 2) increasing channel capacity in four critical reaches most likely to have severe flooding by removing constrictions and modifying channels, and 3) enlarging the extent of tidal wetlands and so increasing the volume of water that moves in and out during a tidal cycle.

Reports on existing creek conditions in the Ross Valley, and the Capital Improvement Plan Study Report, can be found at www.marinwatersheds.org, under Program Participants. Three articles in this issue of Creek Chronicles describe specific measures in the report: *In-stream Measures and Sediment Management* on page 3, *Detention Basins* on page 4 and *Flood Management and Natural Habitats* on Page 6.



A stand of California bay trees overlooks the Corte Madera Creek Watershed from Loma Alta. Photo by Charles Kennard

Living in a Watershed

by Charles Kennard

A driver heading east from San Geronimo Valley will come across a blue sign reading “Entering Corte Madera Creek Watershed,” and simultaneously realize it is time to change gears, for the car has crested the hill. What is a watershed, and why are so many people promoting the idea?

In American English, a watershed is a valley—narrow, or broad as a plain—or a collection of valleys that all drain into the same watercourse. However this meaning is, according to the Oxford English Dictionary, a “loose” interpretation

of the original usage: the line separating slopes which drain into different watercourses, and is less confusingly known as a drainage divide. The expression “watershed event” reflects the original meaning, of a turning point—not of a harbinger of universal change. Here we will use the scorned “loose” meaning, of a valley or drainage basin.

Modern automobiles have done much to obscure the recognition of watersheds, but watersheds are significant in many ways. California Indian communities were centered on creeks, where the most sought-after natural resources were located, while their territorial limits coincided with drainage divides. This arrangement minimized conflict over resources and conflict that could be provoked by accidental encounters. Local Mexican grant boundaries recognized the same

Inside

Summer Dams	Page 2
Re-plumbing the Watershed for Flood Management.....	Page 3
Detention Basins and Phoenix Lake.....	Page 4
Flood Management and Natural Habitats	Page 6
Thank you to Our Helpers and Volunteers.....	Page 8

Continued on Page 7

Summer Dams

by Parker Pringle

Many people know that adult steelhead trout dart up local creeks to spawn in the winter. But many people don't know that steelhead of all sizes, from 1-inch fry to 16-inch smolts, move throughout the stream system in every month of the year when water is flowing. Another thing people may not know is that dams are built every year in the watershed by children and well-meaning adults, and that these dams can block the movements within the watershed that are critical to the steelhead life cycle.

Dams of all sizes can have an impact on steelhead. Obviously Phoenix Lake dam on Ross Creek completely blocks steelhead from accessing the excellent habitat upstream of the dam. The small, temporary dams built, for the most part, by children playing in the creek during the low-flow season, can have the same effect. For example, take a 12-inch-high dam of gravel, rock, and concrete rubble that kids might build in an afternoon and then leave in place. Water will flow through the bottom of this dam, leaving the top dry, and fish will not be able to swim past it, because fish need surface flow to move upstream or downstream of obstructions. Even dams which are passable are considered harmful because they can slow and tire fish.

Steelhead travel through the creeks every month of the year in response to various instincts. In the winter, steelhead migrate into the watershed from the ocean to spawn, and after spawning they may migrate back down to saltwater. Around the same time, juvenile steelhead undergo a transformation from a stream-dwelling form to an ocean-going form, during which time they are known as smolts. Smolts migrate to the estuary from February through June. Juvenile

steelhead and resident rainbow trout will move upstream and downstream within the creek, in all months of the year, to escape hazardous water conditions, to find food, and to spawn. In Ross Creek and San Anselmo Creek, which go dry in long stretches during the summer, steelhead born in the spring must move to perennial flow sections to avoid being stranded in shrinking pools.

An example of the dramatic effect dams can have on the steelhead population: in 2008 the wet season effectively ended before March 1. Quickly, stream flows diminished to dry season levels. In May of that year, a large gravel dam, about 18 inches tall and 20 feet wide, was discovered on Corte Madera Creek a quarter of a mile above the flood control channel. Water was passing through the base of the dam, but not over it, and it was impassable to steelhead trout, because steelhead need a path of

surface-flowing water to guide them past obstructions. This dam was built sometime in the spring—the worst possible time because smolts were migrating to the estuary. All the smolts from San Anselmo and Fairfax—the great majority of the watershed's smolt population—may have been stopped in their tracks here: they won't jump downstream over dams. This would have severely limited the number of adult steelhead returning to the watershed during the past two winters.

Building dams or otherwise altering the streambed in a way that impacts the flow of the creek requires permission from the Department of Fish and Game and other agencies. Some creekside homeowners build summer dams in the belief that they are benefitting fish, but these fish are effectively prevented from following instincts that have preserved the species for mil-

(Continued on Page 6)

Flood Lawsuits Settled

by Ann Thomas

Three different lawsuits filed in the wake of the 2005 New Year's Eve flooding and subsequent flood fee election have been settled.

In fall of 2006 a group of individuals and businesses that had been flooded filed a class action suit alleging that San Anselmo and 11 other entities had contributed to the flooding. The case did not go to trial. It was settled in principle and the settling defendants are currently working with plaintiffs to document the terms of the settlement.

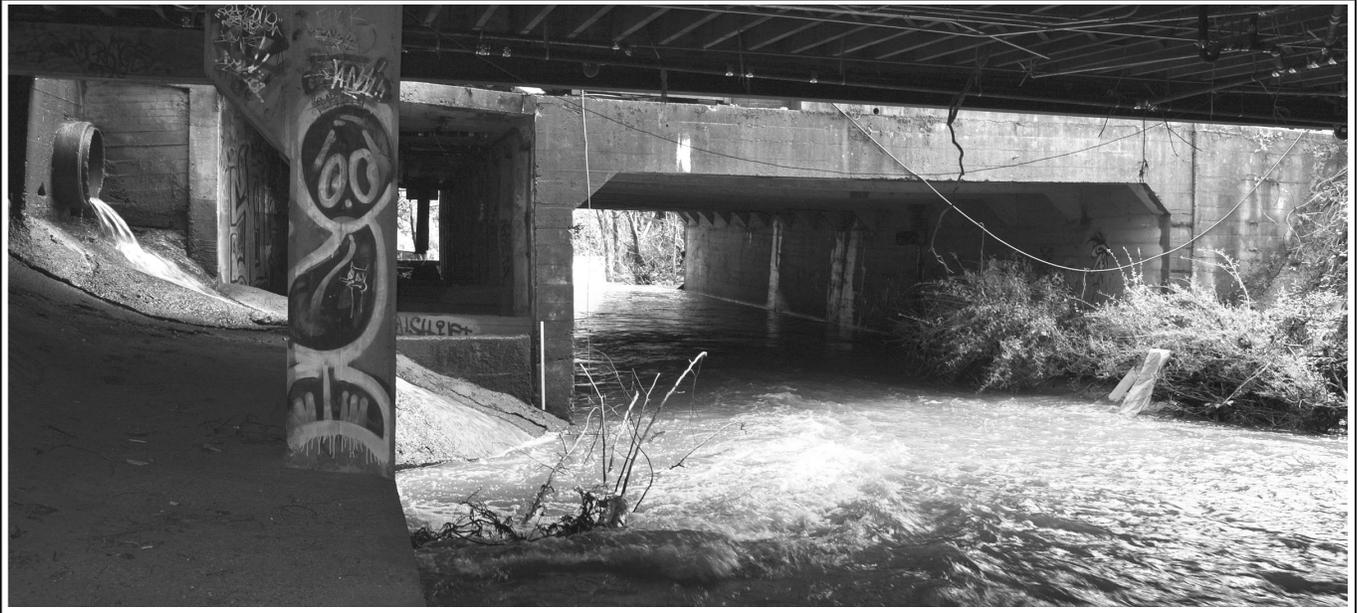
In fall of 2007, following the June election for a storm drainage fee on property within the Flood Zone 9 district, to partially fund a flood protection plan for the dis-

trict, San Anselmo resident Ford Greene filed a lawsuit questioning the legality of the election. In June 2010 the California Supreme Court, hearing the case on appeal, ruled the 2007 election had been conducted according to law and dismissed the lawsuit.

In October 2007 the Marin United Taxpayers Association asserted that the Ross Valley flood fee election failed to comply with Proposition 218. This suit was settled in May 2010 when the county agreed to reimburse plaintiffs for costs and legal fees and also agreed to enter into some non-monetary stipulations regarding any future elections in Flood Zone 9.

Re-plumbing the Watershed for Flood Management

by Sam Wilson



In downtown San Anselmo several businesses span the creek, and the buildings are so low that high flood water will back up against them and spill out into San Anselmo Avenue. At left, a storm drain enters from the vicinity of Andronico's Market. Photo by Sam Wilson

A primary goal of Marin County's flood-management plan for the Ross Valley is to reduce impediments to flow and enlarge channel capacity along Corte Madera Creek and its major tributaries to dimensions capable of containing the one-percent-annual-chance flood (also termed the 100-year flood) in conjunction with large detention basins. The plan specifies over 160 measures to increase capacity in four critical reaches of the watershed: Fairfax Creek, Sleepy Hollow Creek, San Anselmo Creek, and Corte Madera Creek.

Implementing the County's plan has to take into account many potential hydraulic impacts, including the consideration that removing certain constrictions might result in downstream damage at points where the channel isn't prepared to accommodate increased flow. Hence, implementation of conveyance-capacity measures will generally proceed from lower to upper reaches, although there will be a good deal of overlap in timing for

projects that require a number of years from design through implementation. A jurisdictional complication muddies the waters in that while three of the reaches fall within the purview of Flood Zone 9—a collaboration among the County, the City of Larkspur, and the towns of Fairfax, San Anselmo, and Ross—the Army Corps of Engineers is in charge of the lowest reach in the watershed, in Ross and Kentfield. The County and its consultants anticipate a total time horizon, from planning through implementation, of 10 to 20 years.

Following is a sequential listing of major-project implementation in the four reaches. In addition to the measures listed here, which involve mainly bridges, buildings, and other structures, capacity-increasing measures including top-of-bank floodwalls and berms, retaining walls, and channel deepening and widening will also be implemented along sections of all four reaches.

Corte Madera Creek

- Remove timber fish ladder up-

stream of the concrete channel.

- Construct a gradual transition from the natural channel to the concrete channel.
- Construct floodwalls upstream and downstream of the ladder.

San Anselmo Creek

- Enlarge the channel downstream of 634-636 San Anselmo Ave., by measures including replacing the Winship Ave. bridge, increasing channel capacity beneath the bridge at Tunstead Ave., and modifying the channel beneath the creek-spanning building at 241-255 Sir Francis Drake Blvd.
- Either modify or remove the structure at 634-636 San Anselmo Ave., a critical constriction, and remove sediment from beneath the neighboring upstream structures at 638-730 San Anselmo Ave.
- Modify or replace bridges at intersection of Center Blvd., Sycamore and San Anselmo Aves.

(Continued on Page 5)

Detention Basins and Phoenix Lake

by Cindy Lowney

All creeks have a limited capacity. When this capacity is exceeded, creeks overflow their banks and water spills onto the surrounding floodplain. Increasing the capacity of our creeks is a critical component of a watershed-wide approach to flood management; however, without large flood walls, our natural creek will be overtopped during a storm such as the 2005 event. Another option, an alternative to flood walls, is the creation of storage areas upstream of critical points where flow breaks out of the channel.

Detention basins are typically comprised of a pool near the creek designed to temporarily hold a substantial volume of floodwater, combined with hydraulic structures which facilitate diversion of flood water to and from the creek. During normal flows these basins would remain empty. During floods, they are filled, and once the storm has peaked, the basins are allowed to drain back into the creek.

The Capital Improvement Plan Study has identified four sites lo-

cated on public land that are suitable for new detention basins. The combination of detention basins and channel capacity improvement are designed to provide flood protection from a storm similar to the 2005 event. In addition to these new basins, one existing facility, Phoenix Lake, may be re-operated to provide additional protection.

Two sites are high in the Fairfax Creek drainage: Loma Alta Tributary and Lefty Gomez Field. The Loma Alta site is located near the end of Glen Drive, in the Loma Alta Open Space Preserve. When full, the basin would inundate about three acres and detain around 25 acre-feet of floodwater. Lefty Gomez Field is located along Sir Francis Drake in Fairfax, at White Hill Middle School. When full the basin would inundate about seven acres and detain 92 acre-feet of floodwater. Two other sites are on tributaries of San Anselmo Creek: Memorial Park and Red Hill Community Park. Memorial Park is located in San Anselmo along Sorich Creek.

When full, the basin would inundate about six acres and detain 82 acre-feet of floodwater. The Red Hill site is located in San Anselmo between Shaw Drive and Sunny Hill Drive behind the Red Hill Shopping Center. When full the basin would inundate about four acres and detain 28 acre-feet of floodwater.

These four basins would be filled when flooding is imminent at key breakout points. Predicted rainfall, together with data from real-time flow monitoring gages at Fairfax Creek near Town Hall and Corte Madera Creek in Ross will provide information that will indicate that it is necessary to fill a particular basin. After the storm passes and water levels in the creeks decline, floodwaters stored in the detention basin would be released back to the creeks in a safe and controlled fashion. The detention basins would not be filled unless flooding were imminent, meaning that during heavy rainfall year some or all detention basins may be filled, and during dry years, they would not be used at all.

Phoenix Lake is owned and operated by MMWD as a reserve-water supply, and also as wildlife habitat and for public recreation. When full to the spillway crest, the lake holds 300 acre-feet of water. Although the lake currently provides some flood protection, changes in lake operation could improve the lake's flood attenuation effect. Improvement to the dam itself as well as excavation of the lake bottom and installation of additional hydraulic structures would be required before re-operation begins.

The Capital Improvement Plan Study has concluded that attenuation of floodwaters through opera-



Lefty Gomez Field at White Hill Middle School in Fairfax is one of the sites being considered for a detention basin to reduce flooding downstream. Photo by Charles Kennard

(Continued on Page 5)

Re-plumbing the Watershed

Continued from Page 3

- Replace Madrone Ave. bridge.
- Replace the Sir Francis Drake Blvd. bridge downstream of Winship Ave.
- Modify or replace the Sir Francis Drake bridge at Tunstead Ave.
- Raise the building at 638-730 San Anselmo Ave.
- Replace Bridge Ave. bridge.
- Replace Nokomis Ave. bridge

Sleepy Hollow Creek

- Replace Taylor Ave. bridge.
- Replace Mountain View Ave. bridge.
- Replace Morningside Ave. bridge.
- Replace Broadmoor Ave. bridge.
- Evaluate potential conveyance capacity improvements at other bridges.

Fairfax Creek

- Replace Sherman Ave. culvert.
- Replace Merwin Ave. bridge.
- Evaluate status of Spruce Rd. bridge.
- Replace Azalea Ave. bridge.
- Replace Scenic Rd. bridge.

For nowhere else in the watershed is the future more uncertain

Detention Basins

(Continued from Page 4)

tion of the four new detention basins and re-operation of Phoenix Lake, as well as implementation of all the practical maximum capacity improvements, would result in 100 percent containment of the 1-percent-annual-chance flood. Although flooding in some isolated areas could be prevented with only one of these approaches, basin-wide protection is achievable only with an approach that includes increased channel capacity and temporary floodwater storage in detention basins and Phoenix Lake.



The beautiful globe lily or golden fairy lantern (Calochortus amabilis) can be found growing above Phoenix Lake, where it blooms in May. Its nodding yellow flowers have tiny fringes and are one-and-a-half inches across. It is uncommon in Marin, but Friends board member Gary Leo has been having a rendezvous with it every year—and will not reveal its exact location. Photo by Gary Leo

than the earthen channel—the stretch downstream of the concrete channel, where the creek enters the estuary. Apart from bureaucratic forces—for example, the Corps and the County currently have an agreement that obligates the County to periodic dredging to a level that would convey a 250-year flood, and the County would like to see this requirement reduced to a 100-year capacity—global warming, with attendant sea-level rise, will also come into play.

Increased tidal circulation to historical wetland areas alongside the main channel will help buffer erosive forces associated with sea-level rise. Three measures will be necessary to increase tidal flow. In some locations, flow is currently limited by culverts that are now deteriorating to ever-smaller capacities. In some areas, the fill placed when the Corte Madera Creek Flood Control Project was constructed has created areas too high for tidal action. One area is completely blocked from tidal action by

a berm. Larger culverts, lowered elevations in some areas, and relocation of one berm will increase tidal flows in and out of these modified wetlands, and this increased tidal volume (or “tidal prism”) will serve to increase both scouring of the main channel and growth of intertidal vegetation in newly inundated areas. Such emergent vegetation protects against shoreline erosion.

Dredging every seven years will be required for the foreseeable future to maintain the 100-year level of protection. There appears to be an overall trend toward reduced sedimentation in the San Francisco Bay estuary (largely due to the residues of 19th century hydraulic mining in the Sierra finally having been washed and barged out to sea), which may allow for less dredging in future decades.

For detailed diagrams of all that is planned in the Ross Valley, superimposed on aerial photographs, visit <http://marinwatersheds.org>, Program Participants, and see Capital Improvement Plan Study Report.

Flood Management and Natural Habitats

by Sandy Guldman

The land use changes and development that have made the flood risk so high in the Ross Valley have correspondingly damaged its natural habitats, and reducing flood risk will in most cases also benefit habitat. The abundant steelhead and coho populations of pre-settlement times are unlikely to return, but we hope to make enough improvements that we will have a robust steelhead population, abundant riparian birds, healthy native vegetation, and more tidal wetlands.

Many flow constrictions are also barriers to steelhead passage. Examples of projects that both contribute to flooding and impair or totally block steelhead passage are the wooden fish ladder at the upstream end of the concrete channel on Corte Madera Creek, the sewer/fish ladder/bridge combination on San Anselmo Creek at



Sleepy Hollow creek downstream of Taylor Street is a text-book example of creek problems: a vertical retaining wall narrowing the creek; concrete debris in the channel; an undersized culvert at Taylor Street; a culvert that is a barrier to fish migration; and a lack of riparian vegetation. Photo by Charles Kennard

Summer Dams

(Continued from Page 2)

lennia. When projects are undertaken in the streambed which alter the flow of the creek or dewater it, permits must be secured to do so.

Playing in the creek is a wonderful pastime for children, but we ask that if you have young dam builders in your household or backyard, let them know about the deleterious effects dams can have on fish populations. Explain to them that steelhead need to be able to travel up and down the creek like we need to be able to travel up and down our roads. Ask them to enjoy the creek in a different way. If you find dams on your property, please dismantle them completely. Spread the word to your neighbors that it is important that dams are removed from the creek as soon as possible, in all months of the year.

Saunders Avenue, the long culvert at the downstream end of Fairfax Creek, and the Taylor Avenue bridge on Sleepy Hollow Creek.

Armored creek banks throughout the watershed have reduced flow capacity by narrowing creeks, have damaged or eliminated riparian vegetation, removed deep pools where fish can seek shelter from predators and fast-moving winter flows, and separated the creeks from their floodplains. The Improvement Plan Study identifies numerous locations in the four critical reaches where the creek's capacity can be improved by changing the banks and enhancing riparian vegetation. In many cases, these measures will improve fish habitat by providing shade and improving the food supply for fish, improving water quality, increasing the number and quality of summer rearing habitats, and providing more refugia from high winter flows that wash away fish and their nests.

Increasing the area of tidal marshes will also benefit habitat.

The estuary and its tidal marshes support the bay's food chain. They provide brackish water that steelhead need as they adjust to changes in salinity when adults spawn and smolts return to the ocean. Tidal marshes remove pollutants from water, including sediment.

Finally, fewer destructive flood events mean that there will be fewer times when fertilizers and pesticides in garages and sheds are washed into the creek, raw sewage flows in the creeks and streets when sewage systems are overwhelmed, fine sediment is washed into the creeks and the estuary as streambanks and flooded upland areas are eroded, riparian vegetation is damaged, and steelhead and trout and their nests are washed away.

See the pictures in color!

Email Friends, putting the word EMAIL in the subject line, to info@friendsofcortemaderacreek.org to receive *Creek Chronicles* via e-mail only. The color version can also be seen on our website.

Living in a Watershed

Continued from Page 1

principle, but reduced boundaries to straight lines. So the boundary of Rancho Cañada de Herrera, which includes Fairfax and much of San Anselmo, in part broadly follows the watershed boundary from the Meadow Club above Fairfax, to White Hill, Loma Alta, along the Sleepy Hollow/Terra Linda Divide, to the top of Red Hill.

Watersheds can also be considered as ecological units, where plants and animals spread up and down connected streams and through adjacent woodlands and grasslands. The thin exposed soil of ridgeland forms a natural barrier where hawks and owls can pick off small migrating or foraging animals, and any seeds must travel on the wind or on animals' feet. However, interestingly ridgetops are trysting places for swallowtail butterflies and other insects, and the warm air rising up hillsides gives lift to circling turkey vultures and ravens. So a drainage divide is more than simply a hydrographic feature.

The bioregional movement, articulated in the 1970s, promoted watersheds as political, cultural and ecological units, for which its human residents should take responsibility, and as far as possible they should rely on local foods and materials to sustain themselves. Today's sustainability supporters are more politically active than the bioregionalists were, so the watershed concept has been de-emphasized, but fortunately our watershed is of a convenient size for most of us to identify with. If we were New Zealand's Maori people we would introduce ourselves by saying, "Tamalpais is my mountain, Corte Madera is my creek."

Municipal boundaries in the Ross Valley and the Corte Madera Creek estuary area carve up the valley floor, coinciding with only one

drainage divide, that between San Rafael and the Ross-Kentfield-Greenbrae boundaries. However all areas of Fairfax, San Anselmo, Ross, Kentfield, Greenbrae, Larkspur and Corte Madera are within the confines of the 28-square-mile Corte Madera Creek Watershed. Creekside property boundaries were frequently established down the center of creeks, a fact that leads to difficult situations when the creek does what comes naturally: changes its course. According to my Thomas Bros map, a portion of the College of Marin's Ecology Study Area is in Larkspur, even though it is isolated from the rest of the city, thanks to an engineered change in the course of Corte Madera Creek 50 years ago. It is the site of one of Friends' habitat restoration projects.

Friends' full name is Friends of Corte Madera Creek Watershed, expressing our concern with the whole watershed as well as the focus that creeks provide. Much of what happens away from the creeks

affects the creeks. For example: eroding slopes muddy the water, endangering aquatic life; fast storm-water runoff caused by development contributes to flooding; pesticides and fertilizers often reach the creek; and well-water extraction depletes summer creek flows. On top of this, our creeks and their flood plains are the most altered areas of the watershed, while creeks in their natural state have the greatest biodiversity of any part of a watershed.

To deal effectively with the flooding problems in the Ross Valley, county staff and hired experts are analyzing the watershed as a whole, as sub-watersheds, and down to details of bridges, retaining walls, and culverts that determine the ability of the creeks to accommodate flood flows.

To learn more about Marin County's constituent watersheds, whether draining to the bay or to the ocean, go to the county's website www.marinwatershed.org.

Calendar of Events July - December 2011

Please check www.friendsofcortemaderacreek.org for updates

- | | | |
|------------------|-----------|---|
| July | 21 | Monthly Board Meeting, Thursday, 7:00 p.m., San Anselmo Historical Society Room, 110 Tunstead Avenue, San Anselmo. |
| August | 18 | Monthly Board Meeting, Thursday, 7:00 p.m., San Anselmo Historical Society Room, 110 Tunstead Avenue, San Anselmo. |
| September | 15 | Monthly Board Meeting, Thursday, 7:00 p.m., San Anselmo Historical Society Room, 110 Tunstead Avenue, San Anselmo. |
| September | 17 | Coastal Cleanup , Saturday, 9:00 a.m. to noon. Join us to participate in California Coastal Cleanup Day, the premier volunteer event focused on the marine environment in the country. Check the updated calendar at our website in August for location and details. |
| October | 20 | Monthly Board Meeting, Thursday, 7:00 p.m., San Anselmo Historical Society Room, 110 Tunstead Avenue, San Anselmo. |
| November | 17 | Monthly Board Meeting, Thursday, 7:00 p.m., San Anselmo Historical Society Room, 110 Tunstead Avenue, San Anselmo. |

No Events in December. Happy Holidays!

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Friends of Corte Madera Creek Watershed was formed in
1994 and became a non-profit organization in 1996. Our
goals are to protect the health of creeks in our water-
shed and to help the public learn to care for creeks.

Thank You to All Our Helpers and Volunteers

Friends of Corte Madera Creek Watershed wishes to thank the following individuals, organizations, and agencies for their contributions:

- San Anselmo Historical Society and the Town of San Anselmo for providing space for our board meetings
- San Anselmo Historical Society and the Town of San Anselmo for providing space for our monthly board meetings
- Laurel Collins for a fascinating glimpse of the geomorphology of San Anselmo Creek and the changes it has undergone in the last century
- Gina Farr and Alison Quoyeser for work on our animated multimedia piece, *Fish out of Water*, and NBWA and MCSTOPPP for funding
- Stacy Carlsen, Marin County Agricultural Commissioner, and his staff Johanna Good and Stefan Parnay for their amazing success in persuading reluctant property owners to allow treatment of invasive cordgrass
- Marin Municipal Water District, especially Eric Ettlinger, for helping us install and download our string of temperature loggers in Phoenix Lake
- Marin County Flood Control District, Town of San Anselmo, and Ross Valley Sanitary District for collaborating on fish passage projects
- Property owners near Lansdale Station who are working with us on a fish passage project
- The Coastal Conservancy, North Bay Watershed Association, LEF Foundation and California Alpine Club Foundation for funding our studies, designs, and habitat enhancement and restoration projects
- The many creek-side property owners who have given Friends permission to treat invasive cordgrass on their property
- Other dedicated volunteers who make our activities possible
- The many people who make financial contributions that allow us to continue our day-to-day work