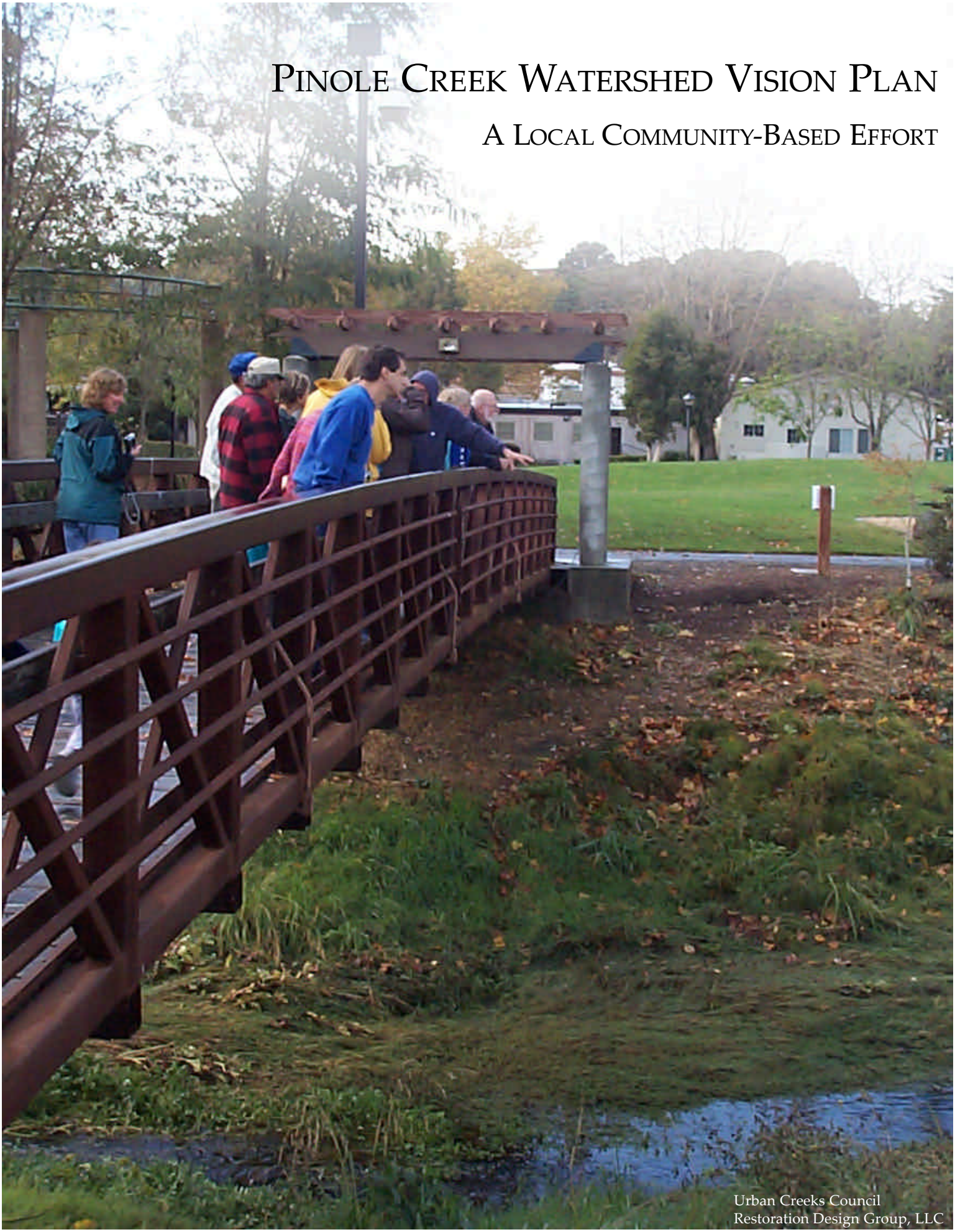
Pinole Creek Watershed Vision Plan

A Local Community-Based Effort



Urban Creeks Council
Restoration Design Group, LLC

PINOLE CREEK WATERSHED VISION PLAN

A LOCAL COMMUNITY-BASED EFFORT

Prepared by:
Urban Creeks Council of California
Restoration Design Group, LLC

In Partnership with:
City of Pinole Redevelopment Agency
Contra Costa County Flood Control & Water Conservation District

Grant funding provided by:
California Coastal Conservancy

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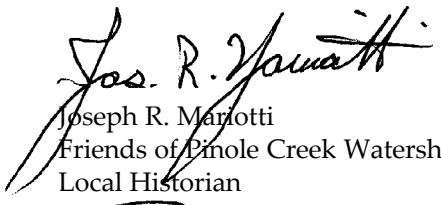
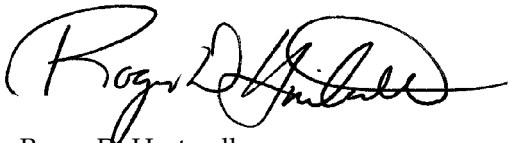
Acknowledgements

We wish to give special thanks to all who provided their time and energy to this effort. In particular we want to thank Frank Nunes, Roger Leventhal, Carole Dwinell, Ann Riley, Roger Hartwell, Kevin Emigh, and Bob Power. We are also indebted to the Pinole Valley High School and the Pinole Public Library for the use of their meeting facilities.

Vision Planning Group Signatures



Joseph R. Mariotti
Friends of Pinole Creek Watershed
Local Historian

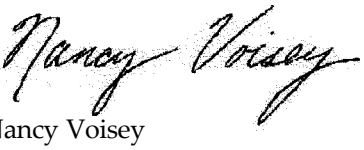


Roger D. Hartwell
Friends of Pinole Creek Watershed
EBMUD Fisheries Biologist

Frank E. Nunes
Briones Valley Rancher
Friends of Pinole Creek Watershed

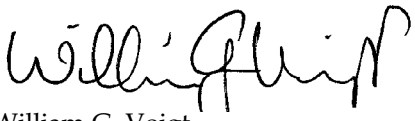
Carole Dwinell
Briones Valley landowner
Friends of Pinole Creek Watershed

Jeffra Cook
Friends of Pinole Creek Watershed
Hercules homeowner



Nancy Voisey
City of Pinole Clean Water Program

Nancy E. Stein
Contra Costa County Watershed Program
Watershed Management Planning Specialist



William G. Voigt
Friends of Pinole Creek Watershed
GIS Analyst and Biologist

Carol Thompson
Friends of Pinole Creek Watershed
Pre-school teacher

Geoff Chandler
Friends of Pinole Creek Watershed,
Pinole Valley High School, Env. Studies
Academy Administrator

Tim McDonough
Friends of Pinole Creek Watershed

Carol Arnold
Watershed Coordinator, Pinole Creek
Watershed Vision Plan

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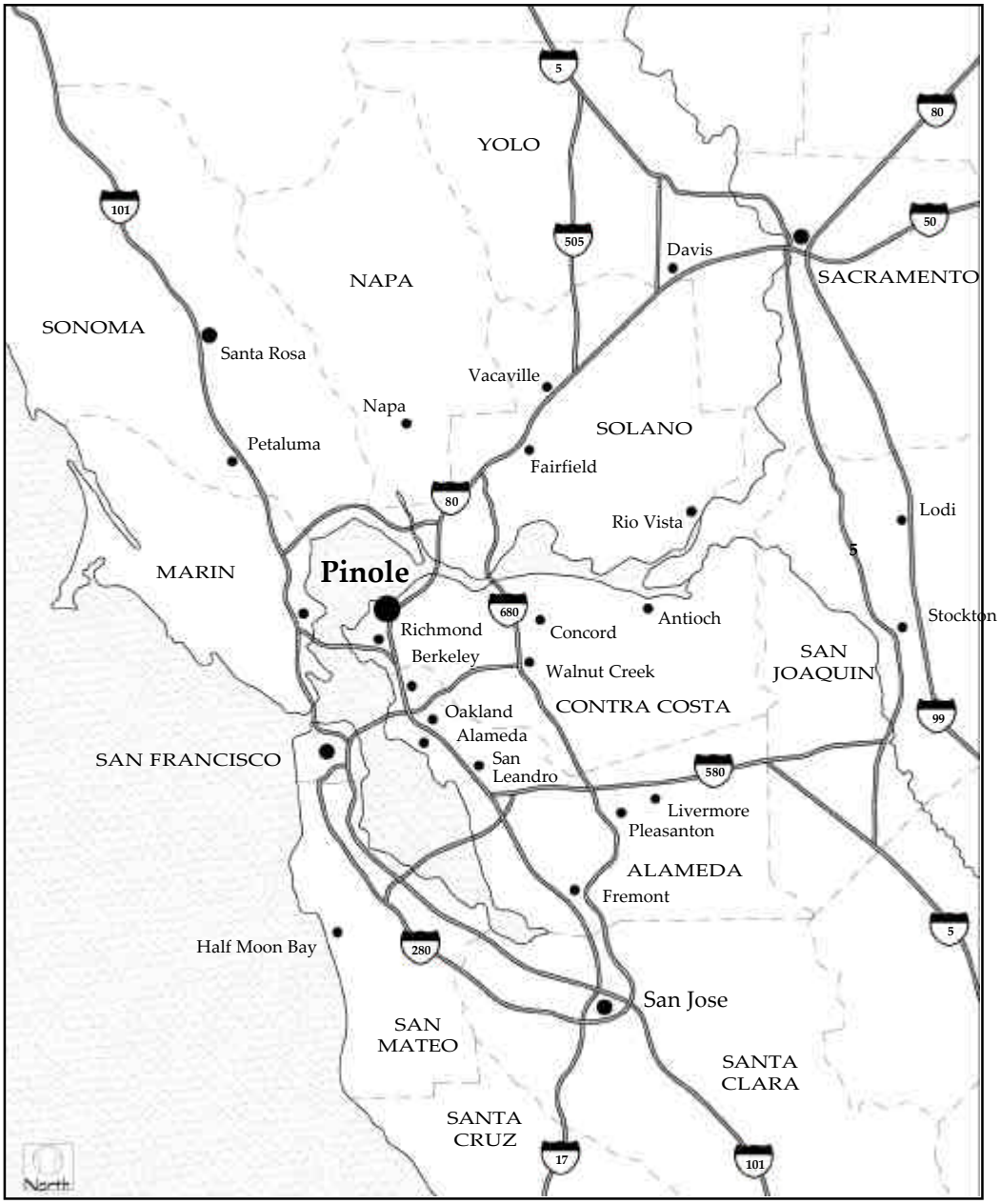


Preface

The Pinole Creek Watershed Vision Plan initially provided a broad community perspective to the Pinole Creek flood control channel redesign project. This California Coastal Conservancy funded plan is a result of a collaborative process between the Urban Creeks Council of California (UCC), Friends of Pinole Creek Watershed, the City of Pinole Redevelopment Agency, and the Contra Costa County Flood Control and Water Conservation District. A related project is the redesign of the existing flood control channel on lower Pinole Creek. While the U.S. Army Corps of Engineers (USACE) is the lead agency for that project, local partners felt it was important to provide the USACE with a locally based design alternative that exemplifies a larger community-based watershed vision. A separate report, also funded by the Coastal Conservancy, presents the community-supported lower channel restoration concept. This concept is summarized briefly in this Vision Plan and is supported by participants in the Vision Plan process.

Introduction

Cattle and the golden hills of the upper watershed

After more than two years of effort, the UCC is pleased to present the Pinole Creek Watershed Vision Plan. While the UCC and the Restoration Design Group made significant contributions to the planning process from 2001 to present, the report represent decades of work by many individuals, agencies and elected officials. The vision plan has been developed through an open democratic process and reflects a wide range of communal interests that may guide public policy.

Executive Summary

The consensus building approach used in the vision planning process established multiple priorities aimed to achieve and maintain a healthy Pinole Creek watershed. The realization of each priority is interrelated to the other priorities and reflects the connectivity between the community and the watershed.

The consensus building approach emphasized by Drew Goetting and the Restoration Design Group integrated many different perspectives into the decision making process. This plan is the product of a constructive and exploratory dialogue. It is this democratic communicative process that has become one of the underlying principles of the vision.

A watershed council that provides a public forum for community members to continue their involvement in the watershed planning process is a fundamental priority of the vision plan. A continued public dialogue in an atmosphere where participants feel safe to be actively involved in the decision making process will allow the community to

manage the resources more effectively. Central to this concept is the idea of a safe venue such as a watershed council where participation is voluntary and private property rights are assured.

A healthy watershed balancing natural processes and wildlife populations was identified as an important element of the vision. The native vegetation and the associated wildlife populations are valuable resources to be protected and cultivated. Water quality is an accurate indicator of watershed health and is a major priority. Pollution and erosion were identified as significant threats to the water quality.

A public landscape oriented towards the needs and values of the community was identified as an important priority of the vision. A regional trail system and open space network that uses the creek as the central element connecting the recreation fields, schools, libraries and commercial developments was identified as a priority. In regards to future commercial developments, the group was concerned about possible impacts to the watershed and deviations from the valued rural character of the upper Pinole Valley.

Educational programs were identified as critical components to any natural resource management plan and watershed vision plan. Educational programs illuminate issues concerning creeks and foster a greater understanding; the simple restoration of habitat is only the first step towards a healthier environment. Programs that inform private landowners about natural creek processes and the regulatory procedures associated with creek-side property should be established or made more accessible.

Flood protection projects that use a multi-objective restoration approach where flood protection, public safety and property values can be maintained or improved while providing habitat and improved water quality were identified as a priority of the vision plan.

With the main priorities identified, the group tried to identify opportunities where the vision could be realized.

People enjoying the view of San Pablo Bay from the mouth of Pinole Creek

Vision

While visionary documents can vary greatly in scope and detail, the main purpose is to collect the fundamental ideas and priorities of local stakeholders and establish guiding principles for future management activities. And while vision plans can effectively influence public policy, it should be made clear that vision plans cannot regulate or mandate any specific action. The power behind a vision plan rests with the individuals involved in the process.

The following statement captures the overall vision for the future of the Pinole Creek Watershed. It is an idealized version of the future, but one that we should strive to achieve.

Community Vision Statement for Pinole Creek Watershed:

The Pinole Creek Watershed unifies a diverse community that is actively involved in its stewardship. Pinole Creek is a central feature of the landscape, and hosts a healthy riparian habitat, including a native steelhead trout population. Its clean waters are safe for children to play in, a creek-side trail links parks, schools, and neighborhoods and local shopping centers and cafes overlook the creek. The upper watershed is rural in character, with rangeland, equestrian, agricultural, and open space uses that are managed for long-term health of natural resources. Property owners, residents, schools, and agencies work cooperatively to protect and enhance the watershed for future generations.

Watershed Components

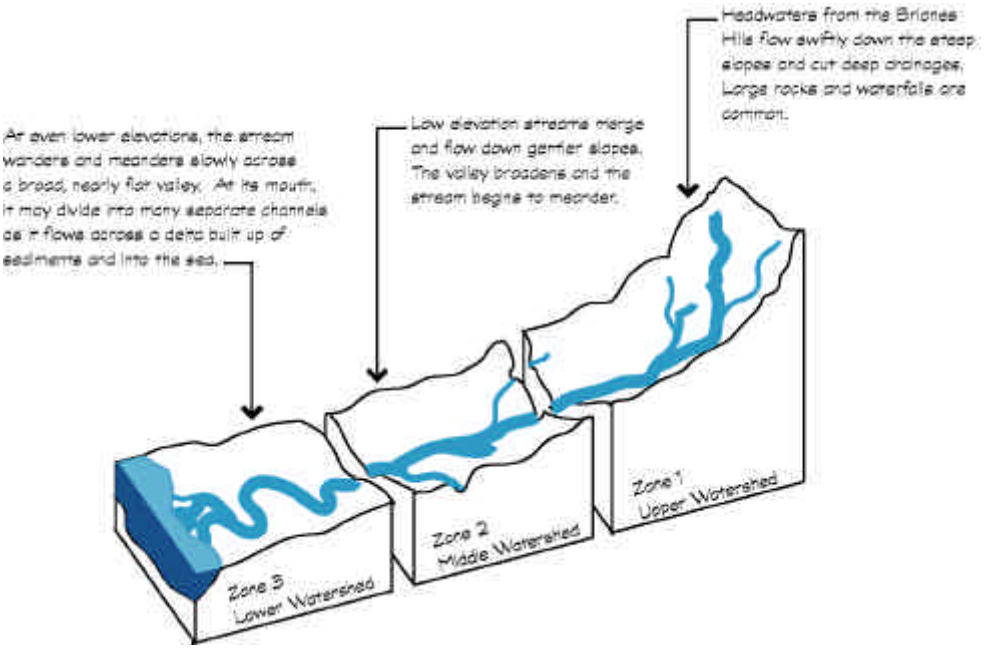
A watershed is a geographic area that drains rainwater into a river, river system, or other body of water and is delineated by the crests of hills. Creeks, streams and rivers accumulate and transport water and sediment from the hills to the valley. These drainage systems are unique geographic features traversing drastically different habitats and may serve as indicators of ecosystem health and vitality. Increasingly watersheds are being used as planning units for natural resources management. People often identify with geographical features more readily than less distinguishable political boundaries. Resource conservation based on watershed boundaries is more recognizable by the community and more accurately aligned with the community's sense of place and nature's regenerative processes.

The agricultural character of the upper watershed is a valuable resource to the community

A pickleweed marsh along San Pablo Bay in autumn color

Physical

The Pinole Creek watershed covers approximately fifteen square miles of the west Contra Costa County Briones Hills which drain into San Pablo Bay north of Point Pinole. The watershed can be divided into three general zones with distinct physical characteristics and geomorphologic processes. In the upper portion of the watershed known as the headwaters, the channels are rocky and steep. It is here that the climate erodes the geologic base material, supplying sediment to the downstream portions. The middle portion of the watershed is referred to as the transition zone because sediments from the hills are being



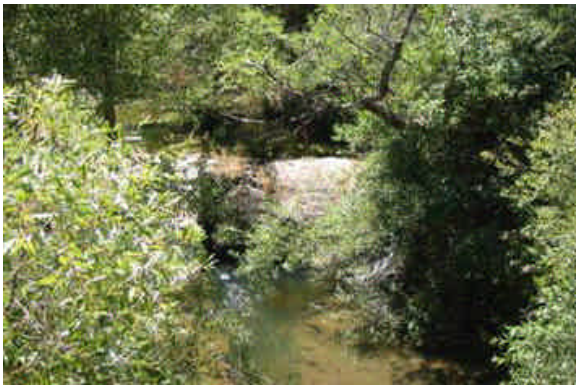
Creek exhibit three distinct zones within a watershed

transferred to the lower portions of the creek. The channel slope is moderate in between the steep headwater channels and the low meandering downstream channels. The lower reaches of the creek meander through a broad alluvial floodplain representing the accumulation of sediments. Occasionally, the high flows overtop the banks and flood the surrounding areas.

Biological

Fishery Resources

Pinole Creek supports several native fish species and a few non-native fish species. A total of sixteen different fish species have been documented in the creek, although most of the introduced non-native fishes do not seem to have persisted (Leidy 1984, CDFG 1975). Data from the most recent Pinole Creek fish surveys indicate a fish assemblage dominated by a handful of native species (Leidy 1999, EBMUD 2001). Fishes captured in these surveys include rainbow steelhead trout (Oncorhynchus mykiss), California roach (Lavinia symmetricus), Sacramento sucker (Catostomus occiden-

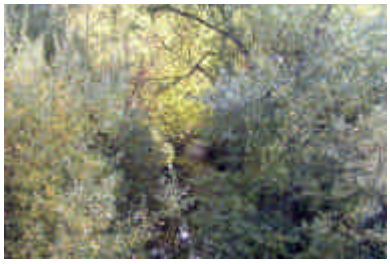


Some segments of Pinole Creek, like this reach in the upper watershed, exhibit dense vegetative cover

talis), threespine stickleback (Gasterosteus aculeatus), prickly sculpin (Cottus asper) and mosquitofish (Gambusia affinis). Mosquitofish and carp (Cyprinus carpio) are non-native fishes found predominately in the lower section of Pinole Creek, below Interstate 80. These are the only non-native species with current sizeable populations in Pinole Creek. Contra Costa County Mosquito and Vector Control plants mosquitofish periodically (Rusmisel 2003).

The oldest official records found in the California Department of Fish and Game (CDFG) archives concerning rainbow steelhead trout in Pinole Creek are from the early 1970s. In 1973, a liquid fertilizer spill killed one hundred steelhead, as well as other fish in Pinole Creek near Highway 80. In 1974, CDFG stocked the creek with one thousand rainbow steelhead trout in response to this incident. CDFG records for Pinole Creek also show plantings of 3,125 steelhead in 1979 and 11,760 steelhead in 1984. It is not known if these plants were successful in contributing to a reproducing population in the creek. CDFG records from creek surveys in 1978 stated that there had been "no successful reproduction in the creek since 1976." This indicates that the first stocking attempt failed, prompting the second plant in 1979 and the third in 1984. No data are available on Pinole Creek fish population from 1984-1991. A genetic study commissioned by EBMUD in 1999 also suggested that the Pinole Creek steelhead population did not likely arise from these CDFG plants. The study used nuclear micro satellite DNA markers to evaluate genetic material from finclips of sixty individuals. The results suggest that Pinole Creek steelhead are more closely related to central California coastal steelhead stocks than to the four most commonly stocked California hatchery rainbow trout strains.

Pinole Creek tidal channel near San Pablo Bay



Dense willow vegetation near the active creek channel

Rainbow trout have been found in every comprehensive fish survey where fish were present and noted or collected in Pinole Creek in the past 35 years. It is not known if these trout are creek resident populations or if they are progeny of anadromous steelhead. In February of 2002, members of Friends of Pinole Creek Watershed observed several adult steelhead (greater than twenty inches in length) in Pinole Creek below Interstate 80. These fish were unable to pass beyond the culvert under the interstate due to unusually low flows. As a result, the fish constructed redds in poor habitat within the flood control channel. These redds likely failed to produce young; however, in early March, a series of storms increased flow and allowed some fish to continue upstream to spawn in the upper reaches of the creek. In April of 2002, a dead twenty-six inch adult female steelhead was found in a tributary of Pinole Creek in the upper watershed on property owned by EBMUD. It is unknown if these fish were originally from Pinole Creek and returned to spawn, or if they were strays from other drainages. However, these events imply that there is currently an anadromous component to the rainbow trout population in Pinole Creek.

Vegetative Resources

The vegetation within the watershed changes from the mountain tops to the valley slopes. The vegetation within the riparian corridor may be separated into several distinctive terraces that have different flood frequency or risk of inundation. Willow and alder are the most dominant vegetation closest to the creek channel and provide the majority of fish habitat. These two plant types have adapted to frequent flooding and provide extensive root systems that stabilize creek banks and resist erosion. The area further from the creek is less adapted to flood but still dependent on a high water table. The oaks and sycamore dominate in this upland terrace and represent the edge of the riparian corridor habitat.

Original exploration route of the east bay shores

Historical

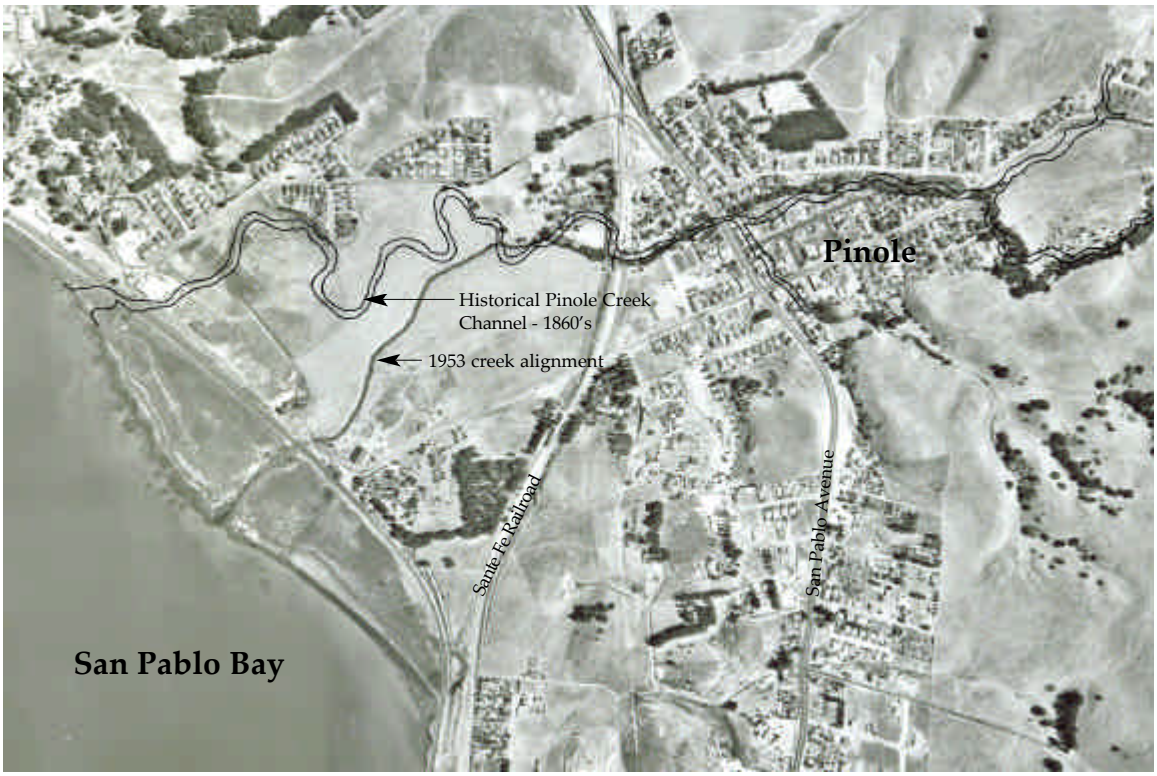
The Pinole Creek Watershed has a colorful history and a diverse people, beginning with the settlement of Native Americans on the West Contra Costa shoreline five thousand years ago. The region was the territory of the Huchiun people. The first Europeans reached the eastern shores of the San Francisco Bay in the 1770s, when Spanish Commandant Don Pedro Fages led his soldiers on an exploration with several Native Americans as guides.


Historical Pinole settlements

In 1823, the Mexican government granted seventeen thousand acres of land to a Commandant of Presidio San Francisco, Don Ignacio Martinez. The land grant was initially known as El Rancho de La Nuestra Sonora de Merced and later named Rancho El Pinole. He built the first adobe in Pinole Valley and brought his family to settle the property with livestock and orchards. A more rapid immigration period began in the mid-1800s with the Gold Rush. Portuguese sailor Bernardo Fernandez developed the Pinole waterfront in 1854 and was able to deliver mail and supplies to the area's farmers. In 1862, Fernandez' first warehouse was washed away by a flood. Undeterred, he soon replaced it with two larger buildings.


The Sante Fe Railroad crosses Pinole Creek on a historical trellis bridge

Historical Alignment of Pinole Creek



The 1856 creek alignment, derived from historical maps, has been overlaid on a 1953 aerial photograph. Past flood control projects significantly altered the fluvial geometry of Pinole Creek by straightening the channel between Interstate 80 and San Pablo Bay.

The Southern Pacific Railroad came to the Pinole area in 1878. With transportation infrastructure in place, California Powder Works moved its production plant and employee housing to the Pinole waterfront, which is the present day Hercules waterfront. Eventually renamed Hercules Powder Company, the plant produced more dynamite during World War I than any other plant in the United States. At the time, the plant was also an economic growth engine for Pinole, where businesses grew to provide support services to the community. The plant closed its doors in the 1970s.

The City of Pinole was incorporated in 1903 with a population of about 1,500. At the time, the town was bustling with an active wharf, a post office, a newspaper (The Pinole Weekly Times), a school, several hotels, saloons, stores and two churches. By 1915, the Pinole Opera House, Pinole Theatre, Bank of Pinole, and numerous other commercial businesses were well established. Outside downtown, farmers and ranchers settled Pinole Valley. The area remained a relatively quiet, rural community through the first half of the 20th century.

San Pablo Avenue in the 1960s. Prior to Interstate 80, San Pablo Avenue served as the main link between all East Bay communities

Construction of I-80 through Pinole in 1958 brought suburbanization from the growing San Francisco Bay Area. Despite the rapid growth, Old Town and Pinole Valley have managed to retain much of their historical character and rural atmosphere. Ranching continues to be a major land use in the upper watershed, and in town, the City strives to preserve its historic buildings. A historic walking tour of the downtown area highlights twenty-seven sites. Recently, the Redevelopment Agency retrofitted and renovated the old Bank of Pinole building for commercial use in 1996. As it celebrated its centennial in 2003, the population of Pinole was approximately twenty thousand. Pinole Creek still flows through the heart of old town.

1958 flood of Downtown Pinole. Photo courtesy of the Contra Costa County Historical Society

Over its history, downtown Pinole experienced periodic flooding from Pinole Creek. In 1965, the Army Corps of Engineers responded by installing a flood control project on the creek between Interstate 80 and San Pablo Bay. The project straightened and armored the channel to protect the downtown area from the fifty year flood. While the project successfully alleviated flooding in Pinole, it was to the detriment of wildlife species using the riparian corridor. In particular, the lack of vegetation and tree canopy deprives creek life of needed food, shelter, and shade.

Political

Several jurisdictions are responsible for establishing land-use policies and regulations in the Pinole Creek Watershed. A majority of land in the watershed is unincorporated and under the jurisdiction of Contra Costa County. Within the city limits, land-use is guided by the general plan and zoning ordinance. Special land designations such as the Briones Hill Planning Area and the EBMUD properties include additional land use restrictions.

Utility lines traverse the hills in the middle watershed

EBMUD watershed lands north of Orinda are located in the Briones Hills planning area and therefore subject to the Briones Hills Agricultural Preserve Area Compact. The compact – made in 1988 between Contra Costa County and the cities of Pinole, Hercules, Lafayette, Martinez, Orinda, Pleasant Hill, Richmond, and San Pablo – sets a minimum parcel size of five acres within the designated area in order to retain a rural character. Small commercial and low-intensity recreation uses are allowed in the Preserve Area, as are traditional agricultural practices.

The middle watershed includes EBMUD land, cattle ranches, horse farms, and more recently some vineyards. EBMUD owns approximately four thousand acres in the middle portion of the Pinole Creek Watershed. The Pinole Valley property was originally purchased as a potential reservoir site. However, there are no water supply reservoirs in Pinole Valley today nor are there any current plans to build one.

Aerial view of Pinole - 1958

Management of EBMUD land is guided by the District's East Bay Watershed Master Plan (1996, revised 1999). The Master Plan establishes a long-term management direction; implementation of plan elements is determined through the EBMUD Board of Directors' annual budgeting process. A range of issues is addressed, including natural resource management, community use and asset management. The plan also sets management directives for each of its properties.

The lowest third of the watershed is urbanized and comprised mostly of the City of Pinole, with some small portions of the City of Hercules and El Sobrante. In this portion of its watershed, the banks of Pinole Creek are owned by private citizens whose properties extend into the creek, and by the City of Pinole for public parks and open space. The Contra Costa County Flood Control and Water Conservation District owns the lowest 1.5 miles of the creek before it enters the Bay.

The City of Pinole General Plan, adopted in 1995, includes a number of goals particularly relevant to this watershed vision plan. These excerpts apply to areas within the jurisdiction of the City of Pinole and are highlighted here because Pinole comprises the

majority of urbanized land in the watershed (refer to the Pinole General Plan for a full list of goals and objectives):

- Preserve and enhance the natural resources, high quality residential neighborhoods and commercial areas, and the small town (semi-rural) character of Pinole.
- Preserve natural resources that provide important habitat, ecological or archaeological value, and maintain clean air and water quality.
- Protect and recognize the natural resources of the San Pablo Bay waterfront for the enjoyment of Pinole residents.
- Concentrate commercial development and mixed-use activity areas so as to provide needed services and tax revenues while not detracting from the overall character of the community.
- Develop and maintain a comprehensive pedestrian, bicycle, hiking and equestrian circulation network and trails system which connects open space, activity areas and recreation areas, provides linkages to regional trails and open space, offers safe recreation opportunities, and provides an alternative to automobile travel.

Looking south from the mouth of Pinole Creek, Point Richmond stretches into San Pablo Bay. San Francisco is beyond Richmond

In addition, the General Plan recommends implementation programs for creek restoration such as erosion control measures, stream cleanup projects, and re-vegetation plans.

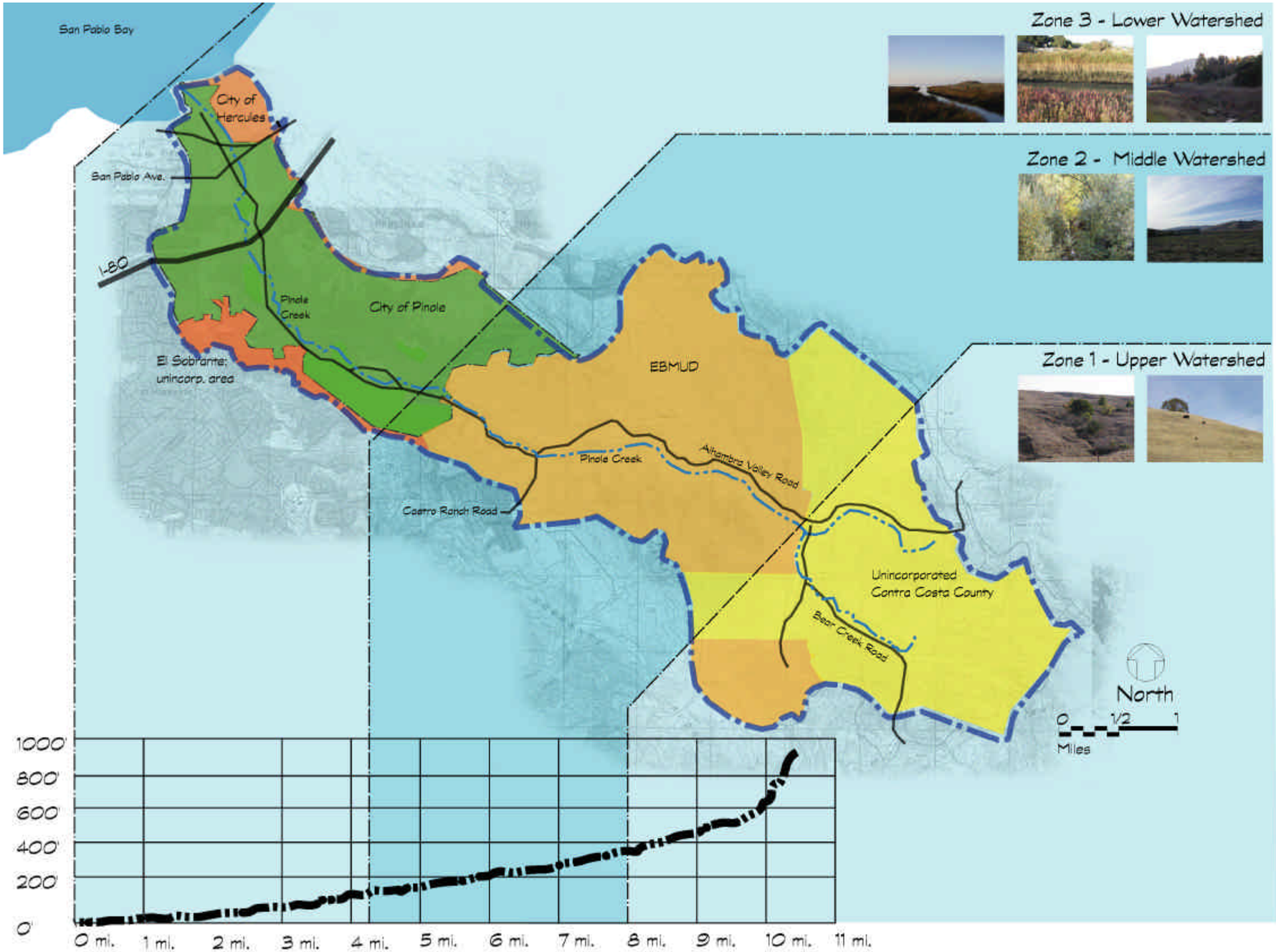
Social

The residents of the watershed are linked to the metropolitan areas of San Francisco and Sacramento by Interstate 80, which traverses the City of Pinole approximately one and a half miles upstream from the bay. San Francisco is located twenty-two miles southwest of Pinole and Sacramento is about sixty-five miles northeast. The City of Martinez, the county seat, is located thirteen miles to the east by Highway 4.

An old barn and rusting field equipment speak to the history of the region and the agricultural heritage of the first non-native settlers

Community members have long been interested in the health of Pinole Creek. This interest evolved into an organized effort when several local residents founded the Friends of Pinole Creek Watershed in 2001. The group is dedicated to protecting and enhancing the Pinole Creek watershed and improving the health of San Pablo Bay. Membership has grown to approximately seventy. The primary activities of the Friends of Pinole Creek Watershed include outreach and education programs such as creek

PINOLE CREEK WATERSHED PROFILE



cleanups, water quality monitoring, seed collection hikes, watershed tours and participation in Earth Day and other community festivals. In addition, the group works to promote watershed stewardship among local youth, for example, through partnerships with the Pinole Valley High School Environmental Studies Academy. Ongoing projects in development include a new plant propagation center and water quality monitoring program.

Student volunteers mulch the library restoration site

In January 2003, the Friends group began work on a Native Plant Demonstration Garden and Creek Re-vegetation Project adjacent to the Pinole Library. The 7,300 square foot upland site will become a native plant garden and wildlife habitat. In addition, a four hundred linear foot segment of Pinole Creek will be re-vegetated with native, riparian plants.

Planning Process

The planning process encouraged learning through open discussion and informative presentations to community members. Under the adopted consensus planning model, all participants must support, agree to, or willingly accept all decisions made as a group. The vision plan reflects the interests, concerns, and priorities of a diverse constituency, including watershed residents, property owners, ranchers, teachers, agency representatives, and many others.

Vision Planning Group on a tour of the watershed

The California Coastal Conservancy provided the initial goal statement:

- To develop a vision for Pinole Creek Watershed to include the creek, recreation elements associated with or adjacent to the creek and watershed restoration opportunities.

Early in the planning process, the Vision Planning Group incorporated flood control into the goal statement:

- To develop a vision for Pinole Creek Watershed to include the creek, recreation, and flood control elements associated with or adjacent to the creek and watershed restoration opportunities.

The planning process for Pinole Creek Vision Plan included three main components over a period of 14 months: open community planning meetings, field trips throughout the watershed, and presentations by guest speakers.

Community Meetings

Vision Planning Group members examine maps

Seven community meetings were held from June 2002 through August 2003. Approximately fifty people attended the kickoff meeting and an average of twenty people attended the subsequent meetings. Early meetings focused on information gathering and issues identification. Meetings were publicized through mailings to over five thousand property owners, emails and flyers posted along the creek trail and in local businesses. An article also appeared in the West County Times following the initial meeting. The meetings were held at the Pinole Valley High School. Drew Goetting of the Restoration Design Group served as the group facilitator. At the beginning of the Vision Plan process, participants agreed to a "full value contract" which stated that the members would enable others to fully participate, listen to one another, focus on the group process, avoid personal confrontations, and work towards common ground.

Vision Planning Group members visit a re-vegetated pond on EBMUD property

Guest speakers addressed topics such as flood management, restoration design, and current land use planning issues. Following this initial phase, the planning group worked to articulate an overall vision for the watershed, develop a set of goal statements, and identify action ideas for achieving those goals. The vision, goals, and actions form the heart of the Vision Plan document and represent the consensus agreement among diverse stakeholders about the desired future of the Pinole Creek Watershed.

Field Trips

The lower portion of Pinole Creek looking east towards to hills

Two field trips were conducted during the planning process. The first trip focused on the upper watershed. Roger Hartwell of EBMUD led a tour of the District's restoration projects. Frank Nunes, a rancher and lifelong resident of the Pinole Creek Watershed, discussed the agricultural practices of the watershed. The group also visited the waterfall considered to be the upper limits of fish migration in Pinole Creek. Drew Goetting led the second field trip which focused on the lower Pinole Creek flood control channel and potential creek restoration opportunities.

Guest Speakers

Over the course of the planning process, several guest speakers shared their expertise on topics related to the Vision Plan. These speakers added to the working knowledge of the planning group and helped further define the goals and objectives of the plan.

Roger Leventhal of Farwest Restoration Engineering provided a digital presentation entitled "Bank Stabilization and Erosion Control."

Ann Riley, a staff expert on flood control and river restoration for the State Regional Water Quality Control Board, provided an overview of stream dynamics and discussed the conventional and more current flood control methods.

Kevin Emigh, a senior engineer for the Contra Costa County Flood Control and Water Conservation District, provided an overview of the mission of the Flood Control District and discussed the evolving goals of the agency, options for environmentally sensitive flood control and current funding constraints.

Carole Dwinell, a resident of the upper watershed and a community organizer, provided an overview of the current status of the proposed upper watershed cemetery and local community efforts to ensure that the project does not adversely impact the environmental quality of the creek or watershed.

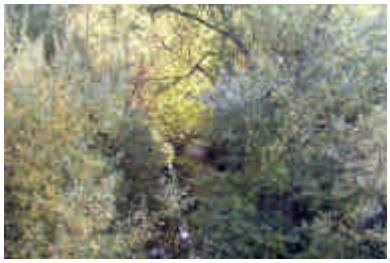
Bob Power, a planner for the Ridge Trail project, provided a presentation on the history of the Ridge Trail and proposed connections through the Pinole Creek Watershed, which would cross EBMUD lands.

The lower portion of Pinole Creek with private property in the background

Results

The stakeholders share common interests in maintaining creek stability and limiting the threat of flood damage. Concerns about the costs of management options and the uncertainty of the regulatory process are common to many residents. This document encourages public agencies to incorporate multiple community objectives in future projects and maximize the returns on public funds. Local control is emphasized because it is the people that live, work, and recreate in the watershed that know it best. The community must live with the outcomes of local management decisions; therefore, they should have a lead role in the decision-making process. The Vision Plan was developed by the local community through a consensus process and will be implemented through voluntary measures.

At the first two community meetings, participants discussed their interests and concerns about the Pinole Creek Watershed. Concerns were organized into six general categories: water quality, habitat, education, private property, development and design, and flood management. Following the brief summation of these six general categories, will be a more specific Goals and Actions section (see page 20), which directly reflects community opinion.



Dense willow habitat in the middle watershed

Water Quality

A number of different factors contribute to the degradation of water quality. Programs that encourage community activism and teach watershed awareness and correlate individual action with watershed health should be promoted. Much of the pollution affecting the Creek comes from many small diffuse sources, called non-point source pollution. Unlike a factory discharge pipe (point source), non-point source pollution is difficult to control but can be decreased through education programs aimed to inform the citizenry.

Stormwater Pollution

The potential pollution from stormwater is diffuse and difficult to quantify. Stormwater runoff carries a variety of harmful substances used in urban environments – fertilizers, pesticides, and automotive fluids are common problems. These substances are transported to local creeks and eventually into San Pablo Bay. Of particular concern is Interstate 80, which crosses the Pinole Watershed and carries thousands of cars each day. Runoff from this freeway flows directly into the creek.

Stormwater runoff patterns in the Pinole Creek Watershed have changed in response to urbanization and other land use changes. With urbanization comes an increase in impervious surfaces – roads, rooftops and parking lots that do not allow water to infiltrate into the ground. As a result, stormwater flows quickly off of these surfaces into streams. This increases the velocity of water running through the creek during a storm, which in turn increases its erosive force. A typical response is down-cutting, or deepening, of the creek channel.

Implementing measures to increase infiltration of stormwater would help to restore the watershed's natural hydrologic pattern. Such measures include retention and detention basins, swales, permeable pavement, and other storm water "best management practices." These practices improve water quality and reduce the amount of flood waters downstream. Vegetation also has a high capacity for absorbing pollutants from runoff. In urban areas of the watershed, large areas of pavement and stream culverts diminish the landscape's natural ability to filter pollutants.

Dumping is a common problem on Pinole Valley Road

Dumping and Litter

Pollution and dumping lead the list of water quality concerns. There are several dumping areas along Pinole Creek that regularly receive debris, including large items such as furniture and electronics equipment. Dumping can cause multiple problems for creeks. Materials can break down and pollute the water, large debris can deflect creek flow and cause bank erosion, and wildlife can be adversely affected. Dumpsites in the Pinole Creek Watershed include various road pull-outs along Pinole Valley Road in the upper watershed and the reach of the creek behind the Pinole Valley

Shopping Center. Litter from streets and parks can also drift into the creek. Regular street sweeping programs mitigate the litter problem but additional outreach is needed to prevent dumping and litter. Additional legislation that prosecutes violators in a more severe manner might deter the dumping.

Animal Waste

Residents are particularly concerned about animal waste pollution from horse boarding facilities in the upper watershed. Horse keeping is allowed without special permit on agriculturally-zoned land in Contra Costa County or without specific limits on the number of horses allowable per acre. The use of wood shavings to absorb waste is a common manure management practice. The disposal of these shavings can be a problem because hauling is expensive and the shavings cannot be composted. Concrete containers for manure can also be used.

State and federal water quality regulations prohibit pollution of creeks from animal wastes. Residents are concerned that agencies responsible – the Regional Water Quality Control Board and Fish and Game Department – do not have staff resources to adequately enforce these regulations. Contra Costa Environmental Health also works to ensure safe disposal of solid waste. Education and enforcement efforts should be increased to ensure proper horse facilities management to prevent potential pollutants such as excess sediment, nutrients from manure and other waste, excess organic material such as shavings with manure, pesticides from fly sprays, and removal of streamside trees and shrubs.

Several horse owners in the upper Pinole Creek Watershed have expressed interest in evaluating their facilities. Horse Keeping, a publication by the Council of Bay Area Resource Conservation Districts in partnership with the USDA Natural Resources Conservation Service, is available to help owners self-evaluate their property and voluntarily select conservation measures to improve water quality.

Sediment

The planning group agreed that erosion control on private property is a major concern in the watershed. Eroding hillsides, creek banks, poorly designed dirt roads and mismanaged construction sites contribute excessive amounts of sediment to the channel and further degrade water quality, compromise fish habitat and threaten private property. Too often, property owners unwittingly respond to creek bank erosion by using hardscape that exacerbates the problem and causes new problems upstream or downstream.


Erosion in the upper watershed

Private property owners have expressed difficulty in acquiring technical assistance necessary to address their concerns about erosion and bank failure. The costs associated with common erosion prevention techniques may be beyond the resources of many private property owners.

Mosquito Abatement

With the proliferation of West Nile Virus across the United States, mosquito abatement is an increased concern. Areas with stagnant water adjacent to the creek provide breeding grounds for mosquitoes. At the same time, the use of chemicals to eradicate mosquito populations could potentially degrade water quality. Suitable biological controls such as BTI (Bacillius thuringiensis subspecies israelensis) should be explored where it is a viable alternative (Alameda County 1999, Rusmisel 2003).

Water Quality Monitoring

In 2002, Contra Costa County initiated a macro-invertebrate sampling program to assess water quality in Pinole Creek. The results from the first year of sampling have been compiled. Overall, the sampling found that segments of Pinole Creek owned by EBMUD had the best water quality while the samples taken in the upper and lower watersheds were of lower quality. (Contra Costa Clean Water Program 2002)

Ongoing water quality monitoring and data sharing will be important to develop an accurate picture of the health of Pinole Creek. Better monitoring will help agencies and organizations target restoration and enforcement efforts to areas with the most serious problems.

Habitat

Signs warn drivers to watch for wildlife

Ensuring healthy habitat for fish and other wildlife species is of high interest to community members. Creeks provide wildlife travel corridors that can host a wide variety of vertebrate and invertebrate species and diverse native plant communities. Historically, Pinole Creek Watershed hosted a healthy population of steelhead trout (oncorhynchus mykiss). Despite the obstacles left by urbanization, remnants of this native stock still live in the creek today. A study on historical Bay Area salmonid populations by the Center for Ecosystem Management and Restoration (CEMAR) identified the Pinole Creek Watershed as a good candidate for restoration. CEMAR is seeking funding to develop a steelhead restoration program for Pinole Creek.

Based on existing studies on steelhead and rainbow trout in California, possible limiting factors for steelhead in Pinole Creek include high summer water temperatures and low dissolved oxygen in some reaches, excessive sedimentation, and fish passage impediments (McEwan and Jackson 1996, Harrington and Born 2000). Additional studies are needed to further understand the limiting factors and determine the best restoration methods for native fish populations.

Invasive plant species such as giant reed (Arundo donax), Scotch broom (Cytisus scoparius), yellow star thistle (Centaurea solstitialis), Himalayan blackberry (Rubus discolor) and many others are established in segments of Pinole Creek. These plants can cause a variety of problems, threatening the diversity of native plant populations, diminishing habitat value, consuming large amounts of water, and increasing fire hazard with large amounts of biomass.

Education

Planning group members identified education as a key component to improving all areas of watershed health. Conversely, a healthy watershed presents valuable opportunities for learning – imagine schoolchildren witnessing steelhead migration in their own backyards.

There is a continued need for education about watershed health, pollution, and water quality. Efforts are needed to target property owners whose actions can directly affect creek health. Planning group members identified a need for improved assistance and better access to agency representatives. Teachers and students were also identified as important target audiences to ensure a next generation of watershed stewards.

Garbage containers and signage help reduce litter and provide educational opportunities

Private Property

Landowners are concerned about trespassing, liability and privacy, particularly as watershed monitoring and restoration efforts go forth in the future. To alleviate these concerns and to encourage actions that improve watershed health, there is a need for improved communication with creek-side landowners. While there are numerous resources available to residents interested in restoration, many landowners are unaware of assistance programs.

Other concerns related to private property ownership include maintaining rights to develop property consistent with existing planning and zoning, and providing assistance to navigate complicated creek-related regulations from multiple jurisdictions.

Development & Design

Planning group members observed that development in the Pinole Creek Watershed generally underutilizes the creek as a resource. For example, businesses should face the creek and subdivisions should incorporate the creek as a site amenity. Pinole Creek currently flows behind many parking lot walls and backyard fences. In some cases, creeks are even buried underground in culverts.

A street terminus with guardrails could be transformed into public open space with connections to regional trails and the creek corridor and associated wildlife.

Maintaining the creek as an open, natural creek is a high priority for community members. This is consistent with ensuring high quality habitat and improving water quality in Pinole Creek, as described in the previous sections. Healthy creeks also provide aesthetic and recreational benefits. There are several vacant lots adjacent to the creek within the City of Pinole. Community members recognize these potential developments as excellent opportunities to integrate the creek and recreation trail in the site plans. The existing Pinole Valley Shopping Center was often described as an example of

development that did not incorporate the creek into its design.

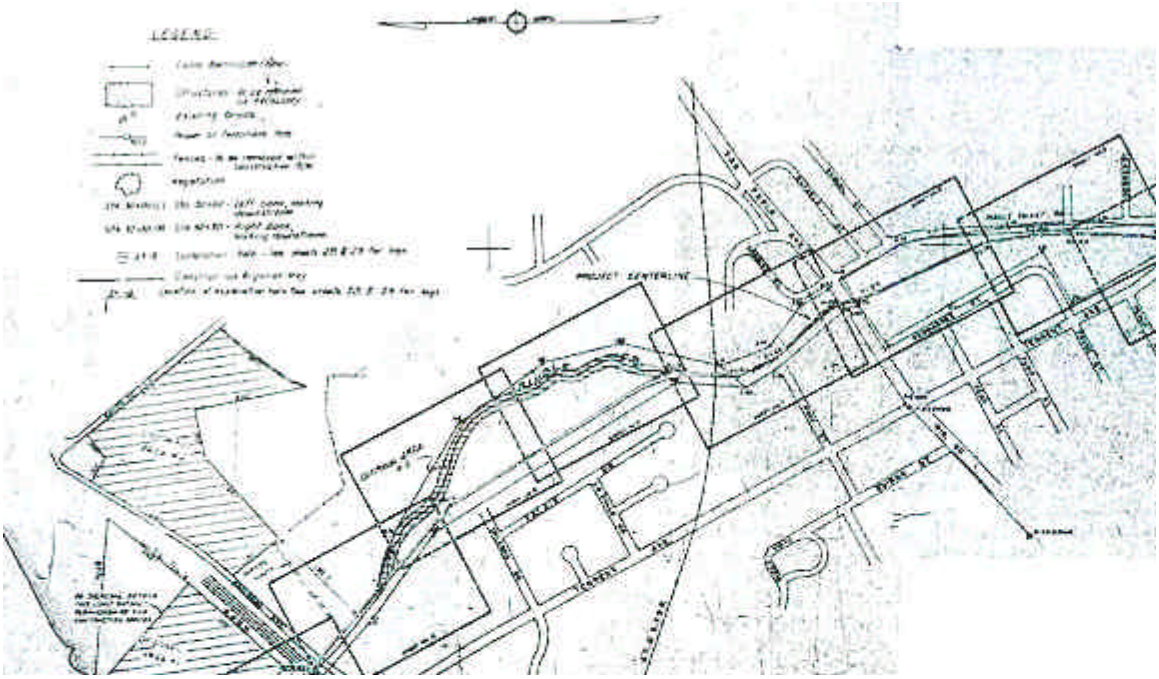
Many residents are concerned about new development and land use changes in the upper watershed because of potential impacts to water quality, flooding, and stormwater runoff rates. Residents are also concerned about the loss of rural character in the upper watershed.

New footbridge crossing near the bay trail

Flood Management

Minimizing flood damage and ensuring safety of the community is a primary concern. Planning group members agreed that flood management projects should preserve or restore natural systems to the extent possible. The proposed lower flood control channel restoration project could significantly improve creek habitat while providing flood protection (see "Opportunities and Constraints" section, page 24). A reliable source of funding must also be identified to ensure long term maintenance of the flood protection function and habitat restoration.

Community members also observed that the maintenance of existing storm drains should be improved to prevent localized street flooding.



A plan drawing from the US Army Corp of Engineers 1953 Pinole Creek flood control project

Goals & Actions

The following list of Goals and Actions was developed from the wide variety of interests and concerns generated in the first two community meetings. The Goals listed represent the result of a consensus discussion among meeting participants. The subsequent Actions listed below each Goal represent a host of possible ways to achieve the Goal. It should be noted that many of the Actions are not necessarily specific to a particular agency or individual. They have been written primarily to express a concept for achieving the stated Goal. We provide these Goals and Actions with the hope that they will be realized but also with the understanding that they can only be effectively achieved through the long-term voluntary commitment by local partnerships.

Goal: Improve the water quality of Pinole Creek where monitoring shows it is impaired.

Actions:

- Collect results of previous monitoring efforts.
- Monitor for water quality, site selection, benthic macro-invertebrates, and chemicals for long-term management purposes.
- Encourage agencies to require polluters to develop clean management practices.
- Address city runoff and erosion through communication and education programs.
- Monitor possible pollution from gas stations.
- Develop incentives for private landowners to address animal waste management problems.
- Monitor for intrusion of sewage into the creek and ensure mitigation of negative effects.
- Explore options for treating water collected on Interstate 80.
- Make water quality data available to all who are interested and all regulatory agencies.

Goal: Restore the health and quality of the Pinole Creek environment to encourage native habitat.

Actions:

- Remove invasive plant species and replant with appropriate native species where possible.
- Restore habitat for native fish and wildlife species. Modify culverts and other structures as necessary to provide for fish passage (e.g., I-80 culvert).
- Increase native biodiversity of the creek corridor.
- Protect existing high quality habitat.
- Promote creek bank stability.
- Coordinate with Contra Costa Mosquito and Vector Control District to understand and minimize mosquito treatment issues.

Goal: Provide educational opportunities to the residents of the Pinole Creek Watershed.

Actions:

- Create educational opportunities along the creek.
- Provide information on creek pollutants and water quality.
- Develop educational signage along the creek where appropriate.
- Maintain "Drains Directly to Pinole Creek" stencils on curb drains.
- Provide information on local cable station
- Provide a resource list/watershed guide to residents and property owners.
- Involve youth in creek education and restoration opportunities.
- Involve local teachers in creek education and restoration opportunities.
- Develop a scaled model of the Pinole Creek Watershed to serve as a demonstration tool.
- Construct better "creek boxes" – small boxes located along public portions of the creek that contain public announcements related to the creek.

The portion of Pinole Creek behind the Collins School is an environmental education opportunity

Concrete pillars on the shores of San Pablo Bay mark the sea level elevations, informing the public about tidal fluctuations in an artistic manner

Goal: Ensure the upper watershed retains its rural character.

Actions:

- Work with cemetery developers to ensure that, if developed, the project conforms to the character of upper watershed and does not negatively impact hydraulic conditions.
- Advocate for the creek in the development process through review of proposed projects.
- Maintain fire roads to minimize erosion.
- Provide updated education on watershed issues to watershed stewards.
- Encourage county enforcement of illegal dumping.
- Reduce invasive plant species.

Vineyards in the upper watershed represent a new land use

Wild turkeys are routinely found in the upper watershed

Goal: Ensure Pinole Creek is complemented by local development.

A fence separates a Hercules neighborhood from the creek.

Actions

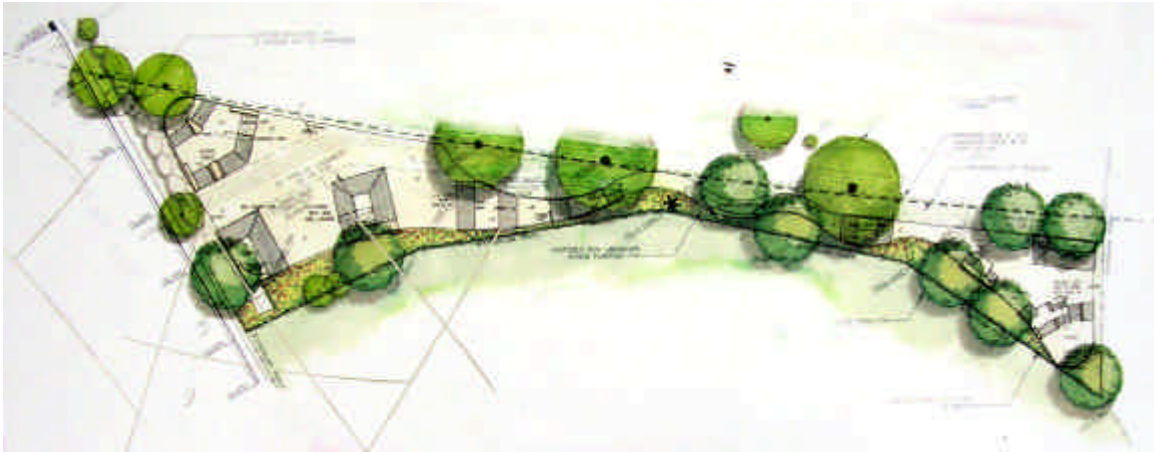
- Redevelop Pinole Valley Shopping Center to include the creek in the design.
- Encourage businesses to face the creek.
- Connect existing trails from east to west of Interstate 80.
- Improve quality and safety of trail resources.
- Coordinate long-term vision with agencies and city to promote creek as an asset.
- Provide safe places for children to play along the creek.

Parking lots and commercial spaces often create rigid boundaries between the natural and built environments

Goal: Assist landowners through the regulatory process.

Actions:

- Work with landowners to develop ideas for streamlining the regulatory and permitting process so that existing regulations can be more easily implemented.
- Ensure that regulatory goals are not at cross-purposes or repeated.
- Provide technical assistance to landowners to navigate regulatory process and acquire permits.
- Make regulatory information readily available to the public – use web, emails, handouts.



The proposed skate park will provide another active recreation area adjacent to the creek and encourage the use of the regional trail system

Goal: Ensure greatest level of flood damage protection possible.

Actions:

- Ensure that flood damage reduction treatments are environmentally sensitive.
- Identify additional flood damage reduction opportunities.
- Involve local community to develop a comprehensive flood damage reduction plan.
- Minimize the use of culverts in managing the creek and its tributaries.
- Maintain the storm drain system.
- Dissipate energy from culvert outfalls to prevent erosion.
- Provide "on request" bank stabilization information or non-profit assistance to private property owners.
- Where feasible, restore the creek floodplain.
- Develop a reliable source of local funding to maintain the Army Corps flood protection and restoration improvements.

Goal: Ensure the rights of private property owners are maintained.

Actions

- Provide creek-related technical assistance on a "request only" basis.
- Discourage trespassing on private property.
- Ensure that private property owners do not incur liability for creek property ownership.
- Ensure that private property owners do not incur liability by working with planning groups.
- Ensure privacy of private property.

Goal: Improve recreation opportunities along the creek.

Actions

- Improve the quality of the existing trail that follows the creek.
- Provide a clear and safe trail route over or under the I-80 freeway.
- Provide access to the creek and trail system from the Hercules housing developments.
- Provide safe creek access and viewing points along public portions of the creek.
- Redesign the flood control channel to be a linear park.
- Redesign trails for safer road crossings – particularly at San Pablo Avenue and Tennent Road.

This trail crossing at Henry Street lacks a crosswalk and safety signs

A new pedestrian bridge near the youth community center provides a vital link between open space in the lower watershed

Opportunities & Constraints

The planning process identified numerous opportunities and constraints which embody shared values. This section highlights the existing resources and ongoing efforts that can be leveraged to achieve the community's vision for the watershed. All implementation actions are to be carried out through the voluntary initiatives of local partners. Different partners can implement different actions. For example, the Friends of Pinole Creek Watershed could lead community education initiatives, while EBMUD would lead restoration work on their watershed lands.

Lower Pinole Creek Restoration Project


Flood control channel entering a concrete box culvert

Pinole Creek periodically flooded downtown Pinole throughout history. In an effort to protect downtown Pinole from the fifty year flood, in 1965 the U.S. Army Corps of Engineers straightened the lowest one and a half miles of Pinole Creek and constructed a flood control channel denuded of vegetation and productive riparian habitat. The Corps has authorization for restoration of past projects under Section 1135 of the Water Resources Development Act of 1986, which provides funding for the planning and reconstruction of previous Army Corps projects that have had a negative impact on the environment.

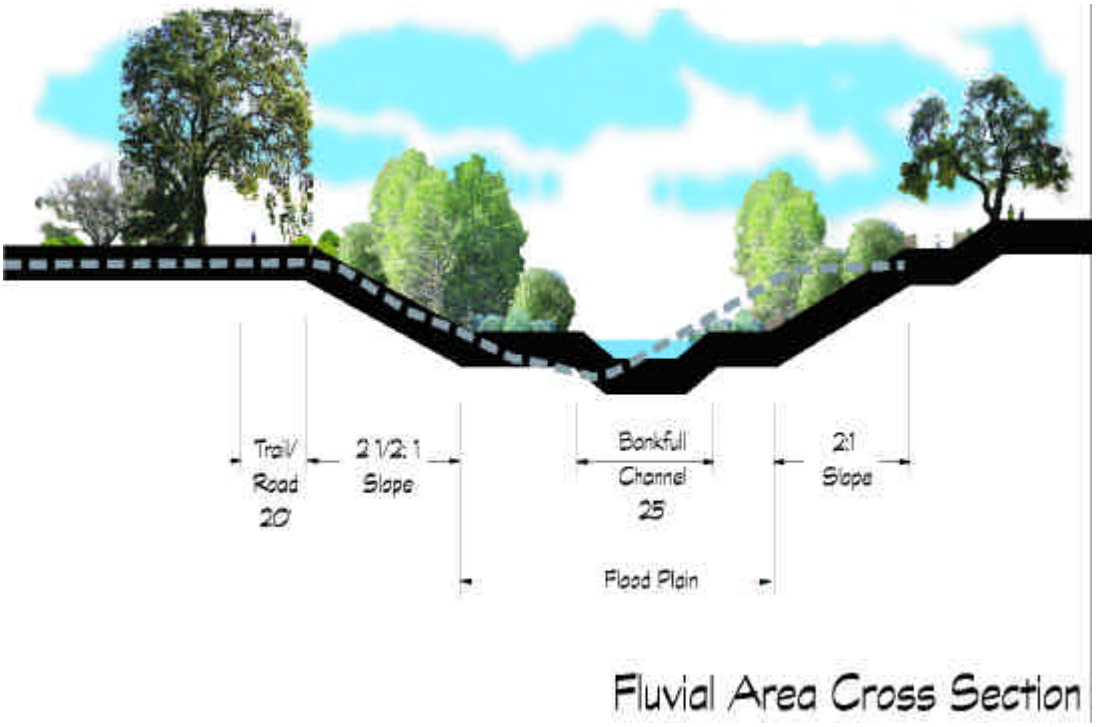
The Urban Creeks Council, with the Restoration Design Group, developed a design alternative for the flood control channel with funding from the California Coastal Conservancy. The proposed design was developed concurrently with and informed by the vision planning process. Major design features include the creation of a low-flow meandering channel, revegetation of the riparian corridor and a regional creekside trail (see concept sketches, next page). Details of this proposed design concept for restoration of the flood control channel are in a separate report.

The Vision Group stakeholders urge the Army Corps to adopt the locally generated design alternative which maintains the current fifty year flood protection, restores riparian habitat and native fish populations, improves water quality and provides additional recreation and education opportunities. Securing federal funding for the restoration of lower Pinole Creek is a significant opportunity to realize the values embodied by the Vision Plan. The Flood Control District is seeking opportunities to increase the flood protection beyond current levels.

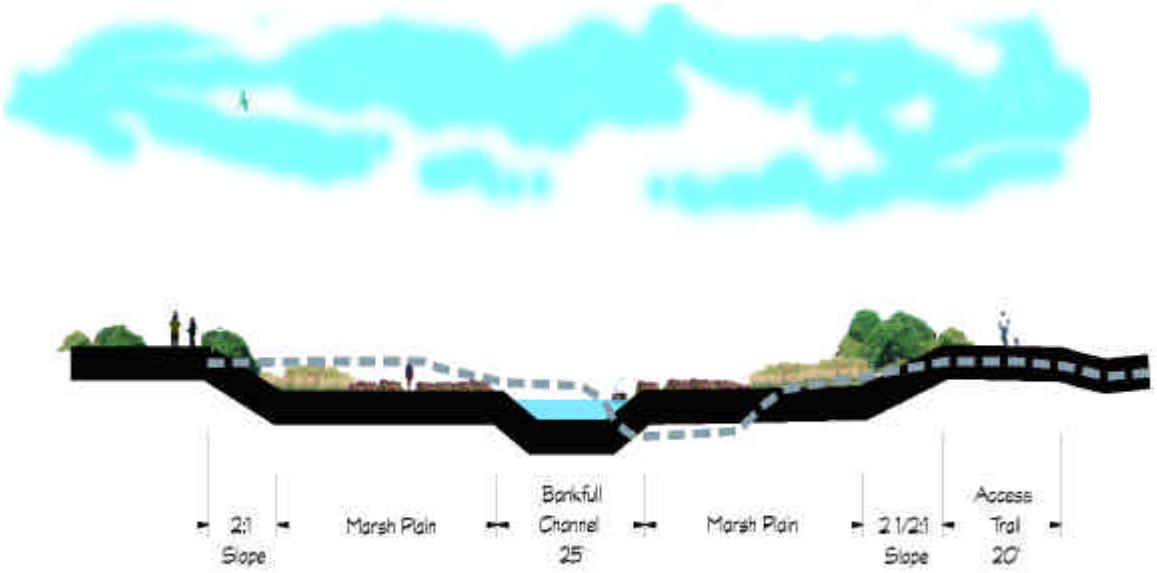
The U.S. Army Corps of Engineers' Section 1135 program provides a seventy-five percent federal match for design and construction costs and fifty percent federal share for recreation benefits. The "local" match required for the cost-share will likely be acquired from state and private funding sources. Local residents would not have to incur capital costs for the design and implementation.

Since the Corps requires a local entity take legal responsibility for maintaining 1135

Lower Pinole Creek Restoration Concept



Fluvial Area Cross Section



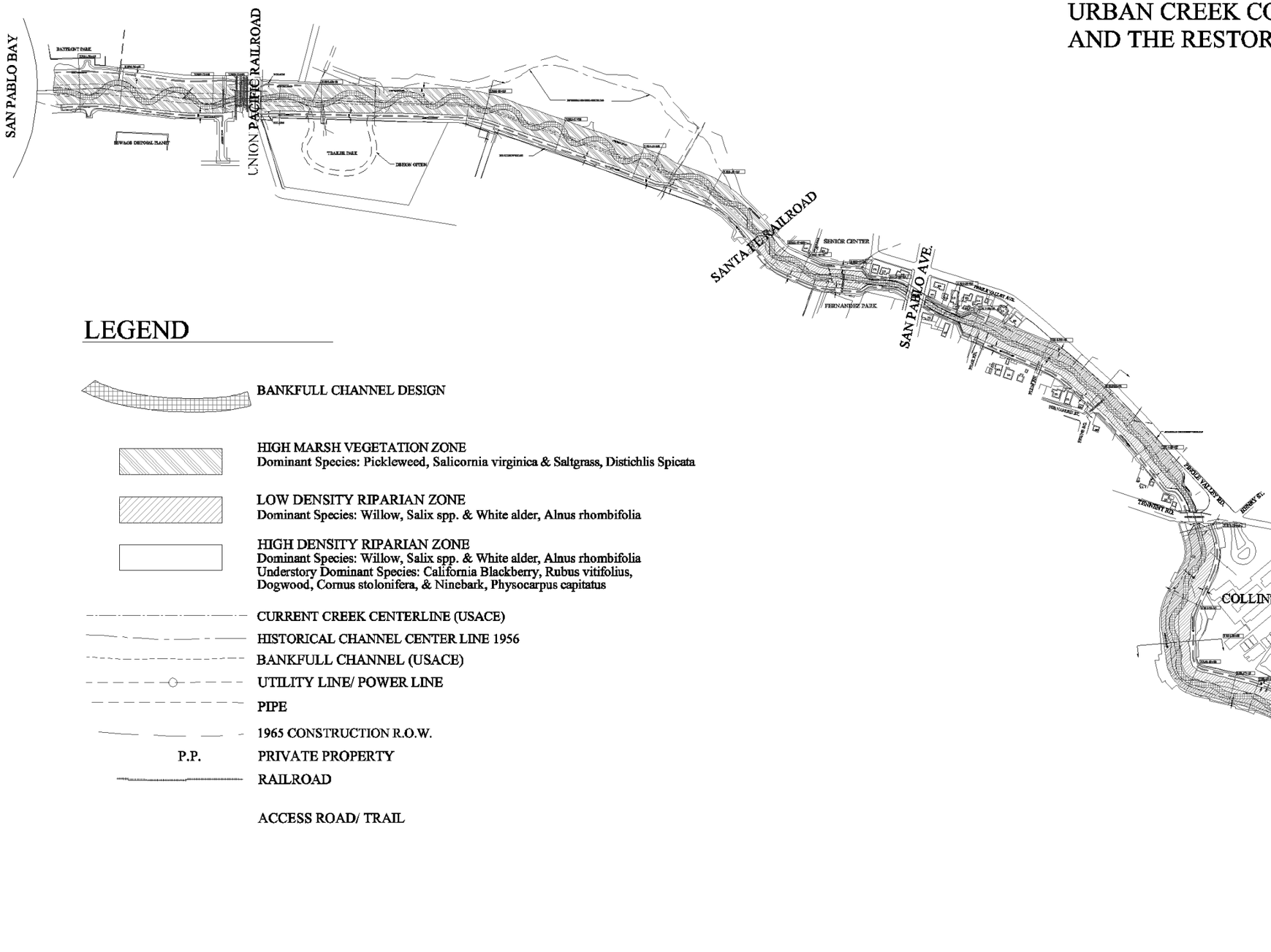
Tidal Area Cross Section

Note: This is a conceptual drawing. Actual trail configuration, revegetation, and channel geometry will be built according to final restoration design.

Dashed line indicates existing channel cross section.

PINOLE CREEK RESTORATION DESIGN CONCEPT - 2003

URBAN CREEK COUNCIL OF CALIFORNIA
AND THE RESTORATION DESIGN GROUP



LEGEND

BANKFULL CHANNEL DESIGN

HIGH MARSH VEGETATION ZONE
Dominant Species: Pickleweed, Salicornia virginica & Saltgrass, Distichlis Spicata

LOW DENSITY RIPARIAN ZONE
Dominant Species: Willow, Salix spp. & White alder, Alnus rhombifolia

HIGH DENSITY RIPARIAN ZONE
Dominant Species: Willow, Salix spp. & White alder, Alnus rhombifolia
Understory Dominant Species: California Blackberry, Rubus vitifolius, Dogwood, Cornus stolonifera, & Ninebark, Physocarpus capitatus

CURRENT CREEK CENTERLINE (USACE)

HISTORICAL CHANNEL CENTER LINE 1956

BANKFULL CHANNEL (USACE)

UTILITY LINE/ POWER LINE

PIPE

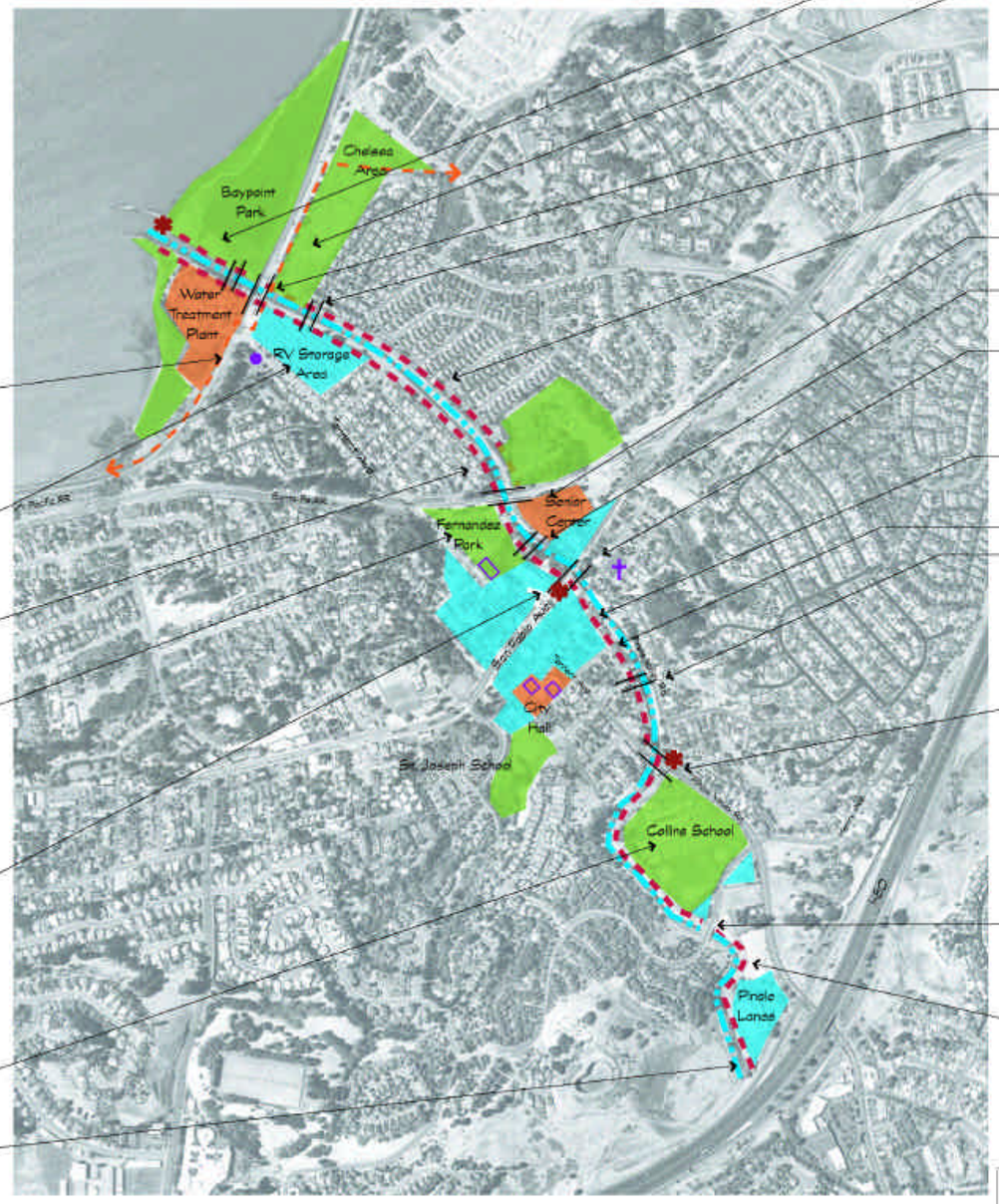
1965 CONSTRUCTION R.O.W.

P.P. PRIVATE PROPERTY

RAILROAD

ACCESS ROAD/ TRAIL

REACH 1 OPPORTUNITIES & CONSTRAINTS



Baypoint Park wetland area is a trail destination point. Opportunity for expanded creekside park.

Possible mitigation area for wetland restoration

Existing Railroad crossing limits channel capacity.

Future Bay Trail Bridge

Opportunity for connections between creek/trail corridor and residential area.
RR crossing is a constraint and a historical opportunity.

Existing pedestrian bridge serves as a key gateway and overlook. Good model for future connections

Overcrossing at San Pablo Avenue is a constraint. This in-stream structure will dictate the channel invert and channel layout. No existing pedestrian crossing.

Parking lot adjacent to the creek is an opportunity to demonstrate the integration of the creek and commercial development.

Opportunity where streets end at Creek/path.

Degraded pedestrian bridge.

Overcrossing at Tennant is a constraint. This in-stream structure will dictate the channel invert and channel layout. Pedestrians use cross walk at traffic light. This bridge is a gateway to the path, school, and downtown.

Overcrossing at Henry Ave. is a constraint. This in-stream structure will dictate the channel invert and channel layout. No existing pedestrian crossing.

Opportunity for increased meander or wider floodplain at vacant lots. Future development should treat creek as an asset and amenity.

Future Bay Trail

Existing RV & Boat storage lot. Opportunity to increase the marsh floodplain and construct an Audubon Society Environmental Education Center.

Opportunity for connections between creek/trail corridor and residential area at residential cul-de-sac.

Opportunity to integrate Fernandez Park, proposed skate park, and Pinole Creek. Expand the riparian corridor.

Opportunity to integrate the historic walking tour sites concentrated along San Pablo with the creek and trail.

Opportunity to convert the Collins School ball field into a multi-use flood detention basin and add environmental education components.

Interstate 80 Freeway is a constraint, impacting water quality and channel width.

Symbols Key

- Trail node/destination
- Park, school, or open space
- Public facility
- Commercial land use
- // Bridge/overcrossing
- Multi-use trail & flood control access
- Pinole Creek
- Historic tour site or cultural landmark

REACH 2 OPPORTUNITIES & CONSTRAINTS

projects, the local community will be responsible for the maintenance costs. Therefore, a reliable funding source must be secured prior to local community approval. This possible constraint could be alleviated by several funding mechanisms that would ensure adequate funding for maintenance by the Flood Control District.

Pavon Creeks


An aerial view of Pavon creeks

The Pavon creeks are four tributaries to Pinole Creek located on the Pavon pasture area near Castro Ranch Road on EBMUD land. At the request of EBMUD, the Army Corps of Engineers obtained a congressional authorization for a Section 206 project under the 1996 Water Resources Development Act (WRDA) to restore the Pavon creeks. This program provides federal funding for aquatic ecosystem restoration projects. EBMUD is serving as the non-federal sponsor for the Pavon creeks restoration. A non-federal sponsor and matching funds are required for Section 206 projects.

The restoration project affects almost two miles of tributaries and includes the restoration of approximately six acres of degraded riparian habitat and twelve acres of associated upland habitat. These first order drainages currently have experienced significant erosion from storm water runoff, followed by channel widening and excessive sedimentation into Pinole Creek. High rates of sedimentation can adversely affect habitat for aquatic species, including sensitive and federally threatened local species such as steelhead trout (Oncorhynchus mykiss). It is believed that major contributors to erosion include a soil type susceptible to landslides, long standing agricultural practices and changes in drainage patterns. Drainage patterns were changed when nearby Castro Ranch Road was rerouted in the late 1980s to accommodate residential developments south and southwest of the Pavon project area.


Future Pavon creeks restoration site

The EBMUD efforts to restore riparian habitat and stabilize channel erosion along the Pavon creeks already have significant momentum and the support of multiple agencies and community members. The Friends group supports the bioengineering techniques that this restoration will utilize to stabilize the creek banks because of its potential for also improving riparian habitat value and water quality. The restoration project could also serve as a demonstration site for landowners with similar bank stabilization and erosion control problems. The project could also serve as a training opportunity for those willing to volunteer their time to install the soil bioengineering treatments in exchange for the benefit of learning these simple, low cost, restoration methods. The Friends of Pinole Creek Watershed will provide volunteer labor during the replanting phase and will continue to contribute towards the success of the project.

Management measures will include planting vegetation to improve the quality of habitat, bioengineering to stabilize creek banks and additional measures to protect and stabilize the creek and limit erosion. The Pavon creeks project could serve as a demonstration site for the application of environmentally sensitive restoration techniques.

An EBMUD representative led the Pinole Creek Vision Group on a tour of the Pavon creeks site in September 2002. The group discussed issues related to and plans for the restoration project. The Vision Group stakeholders support the restoration project.

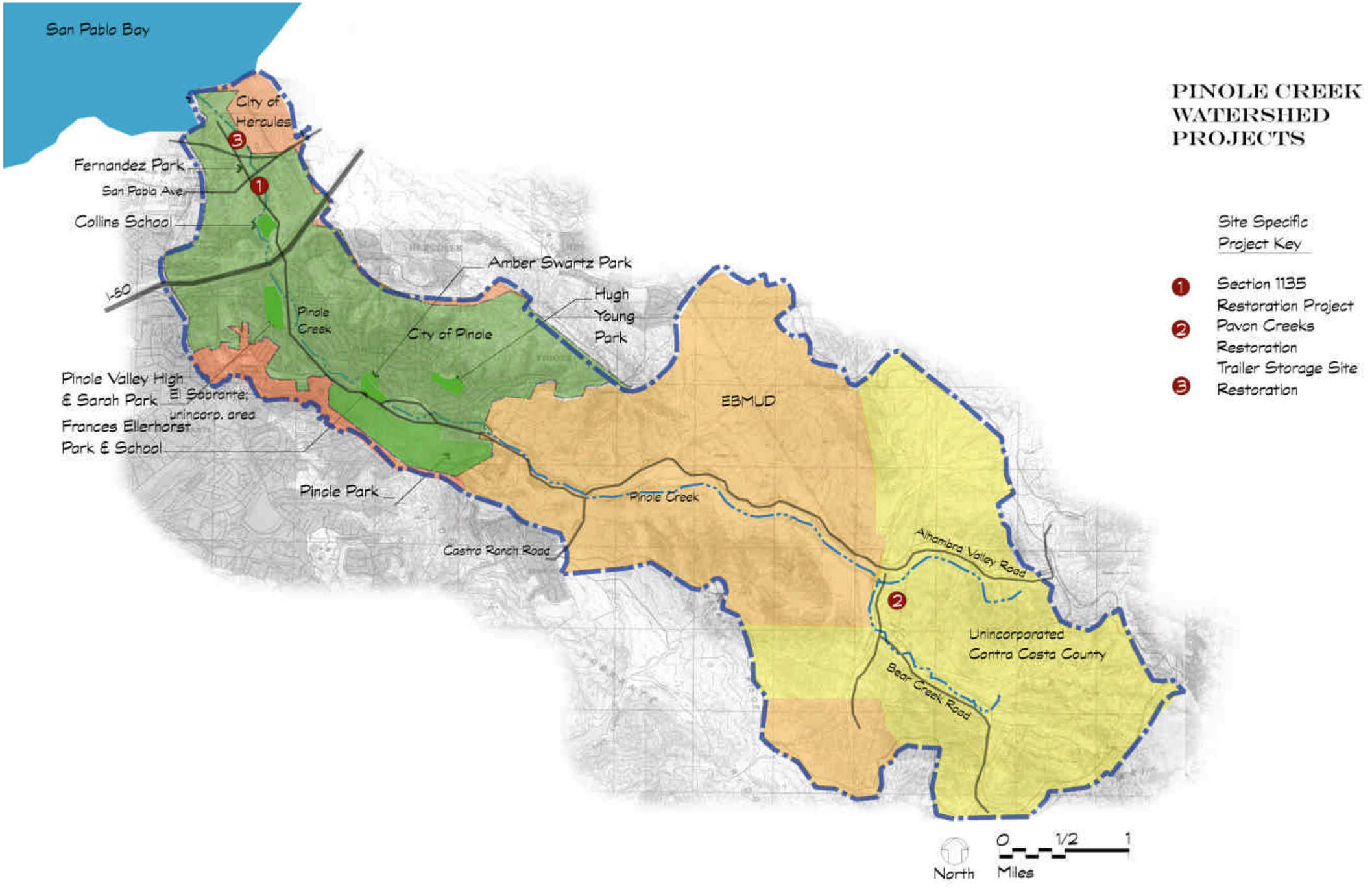
Trailer Storage Site

The trailer storage site – a five acre parcel located to the south of Pinole Creek just upstream from the Southern Pacific Railroad – is a potential restoration site. Currently, the property is used for storage of recreational vehicles and boats. The Pinole General Plan Land Use Element identifies the trailer storage site as an "Environmentally Sensitive Site" and states under goal LU5, "assure that any development on environmentally sensitive sites protects important natural resources and recognizes hazard constraints." Several possibilities for the future of this site (or portions of the site) are listed in the general plan, including a staging area for the Bay Trail, expansion and/or parking for Bayfront Park, wetlands restoration, multi-family housing or an Amtrak stop for the Capitol Corridor Route to Sacramento. The Friends of Pinole Creek Watershed have started to inquire about the feasibility of acquiring the trailer storage site for wetland restoration purposes.

Regional trail with trailer storage site in background

Development & Design

There are several unique opportunities within the lower portions of Pinole Creek where development and innovative design might acknowledge, protect, reinforce and stimulate natural processes rather than neglect and degrade the resources. Currently, initial plans are being developed for the "Gateway" project that will occupy the vacant lots adjacent to the creek, downstream of I-80. These lots are located on the trail side of the creek and thus provide an excellent opportunity for unique spaces accessible to pedestrians and bicyclists.



PINOLE CREEK WATERSHED PROJECTS

Site Specific Project Key

1. Section 1135 Restoration Project
2. Pavon Creeks Restoration
3. Trailer Storage Site Restoration

Currently in development is a cemetery which will be located in the upper watershed. Local residents have organized in response to the cemetery proposal and hope to work closely with the developer and protect the natural resources.

Contra Costa Resource Conservation District (RCD)

The Contra Costa RCD has been assisting local landowners with conservation practices for over sixty years. The RCD is a special district with a board comprised of local farmers, ranchers, and long-time Contra Costa residents. The District has supported several watershed management planning efforts in Contra Costa County and is working with the San Francisco Estuary Institute to conduct a sediment source analysis and baseline water quality assessment in the Pinole Creek Watershed. This project is funded by the RCD's partner agency, the Natural Resources Conservation Service through a Congressional earmark.

Stream Management Program for Private Landowners (SMPPL)

The Urban Creeks Council provides free advice and assistance to property owners who are experiencing stream-related problems such as erosion and flooding through the SMPPL program. The SMPPL program advocates a coordinated, neighborhood approach to addressing these problems using low-cost, technically and environmentally sound stream management practices. The program is funded by the Contra Costa Clean Water Program and is currently available to landowners in the Pinole Creek Watershed. Streamside landowners should be informed that this resource is available through outreach efforts such as workshops and mailings. Mailings could include additional information about how best to care for Pinole Creek.

Watershed Council

In November 2001, a group of Pinole Creek Watershed stakeholders met to discuss forming a Pinole Creek Watershed Council in anticipation of receiving funding for the Pinole Creek channel redesign and Pinole Creek watershed vision projects through a Coastal Conservancy grant. The stakeholders included representatives from the County Flood Control District, the Contra Costa Clean Water Program, the Pinole Redevelopment Agency, the Urban Creeks Council, EBMUD and Friends of Pinole Creek Watershed. After the Coastal Conservancy approved the grant, this group met in February and May 2002 to respond to the draft project plans and to offer guidance for the June kickoff community meeting. These two meetings

View across San Pablo Bay to the north

included additional stakeholders from the Coastal Conservancy, the Army Corps of Engineers, the Pinole Fire Chief and consultants for the Urban Creeks Council. Although this preliminary watershed council did not meet again, many of the stakeholders participated in the community meetings and followed progress of the projects.

The successful implementation of the Vision Plan will require the continued efforts of these many partners. A formal Watershed Council for the Pinole Creek Watershed will help guide the implementation of the Vision Plan and provide an inclusive forum where future resource management decisions can be discussed. The Council should include representatives from different stakeholder groups, with each member having equal voice in guiding future watershed management activities. Different partners may take various roles in implementing the Vision Plan.

The representation on the Council should include the following stakeholder groups and organizations:

- *Local property owners* - Representatives of local property owners, including landowners in the upper and lower watershed, can provide important feedback. In particular, creekside landowners have an understanding of the creek's conditions year-round and would be most immediately affected by changes in management.
- *Friends of Pinole Creek Watershed*: As discussed in the Background section of this Vision Plan, the Friends of Pinole Creek Watershed have been active in a number of education and restoration efforts along the creek. The group represents an important partner in the implementation of this plan because of their leadership in outreach and education, and their ability to mobilize and coordinate volunteers.
- *US Army Corps of Engineers*: As previously discussed, the Corps is the lead agency for the 1135 restoration project on lower Pinole Creek. This program has the potential to significantly improve riparian habitat and function, making Pinole Creek more suitable for steelhead populations.
- *East Bay Municipal Utilities District*: EBMUD is a large landowner in the Pinole Creek Watershed. Their management of the middle watershed as a water supply watershed has helped to maintain Pinole Creek and its tributaries in a relatively healthy state. Ongoing restoration activities on the Pavon Creeks will serve as important learning opportunities for further watershed improvements.
- *Contra Costa Flood Control and Water Conservation District*: The Flood Control District owns the lower section of Pinole Creek from I-80 to San Pablo Bay and is responsible for maintenance of the Army Corps flood control channel.
- *Contra Costa Resource Conservation District (RCD) / USDA Natural Resources Conservation Service (NRCS):* The RCD and their federal partner, the NRCS, are active in watershed management in Contra Costa County. The RCD and NRCS are working on watershed assessments in Contra Costa County, including an erosion and sedimentation study in Pinole Creek. The NRCS also administers cost-share programs through the Farm Bill to help agricultural producers implement conservation practices on their land.
- *Pinole Redevelopment Agency*: Pinole Creek flows through the heart of Old Town Pinole, which is currently designated as a Redevelopment Area. The creek has

the potential to be enhanced as a community asset and provides an opportunity to highlight the historical elements of the City.

- *City of Pinole Public Works and Parks and Recreation*: These two City departments have direct management authority at various locations on Pinole Creek. Because Pinole Creek serves as the primary outlet channel for the City's stormwater system, the Public Works Department is physically linked to the creek through hundreds of miles of drainage pipe. The City Parks Department manages several parks along the creek.
- *Contra Costa Clean Water Program*: The Clean Water Program is responsible for meeting stormwater pollution prevention requirements under their National Pollutant Discharge Elimination System (NPDES) permit. The NPDES program implements the federal Clean Water Act by issuing permits for activities that may discharge pollutants into water bodies. The permits specify how the permittee will minimize water pollution.
- *East Bay Regional Park District* (EBRPD): The EBRPD manages a small but important portion of the Pinole Creek watershed. The Bay Trail crosses the creek just upstream of Railroad Avenue. The pedestrian and bicycle trail bridge was recently constructed and will provide a link to a trail system that will one day encircle the entire San Francisco Bay.

Conclusions

We have learned through this planning process that comprehensive stewardship can only be achieved through programs that provide assistance to willing and interested property owners and protect property rights as well.

By definition, the resources of a watershed are interconnected. This dynamic provides an opportunity to generate far-reaching benefits and meet multiple objectives through key actions. The following chart illustrates the relationships between the major goals articulated in this plan.

Education pervades all goal areas, whether the target audience is the general public, local students, creek-side property owners or agency representatives. In turn, improved resources would provide better educational opportunities for the community.

Maintaining private property rights also reaches across all goal areas – all actions must be conducted consistent with this principle.

Retaining the rural character of upper watershed will enhance the community's ability to accomplish water quality, enhance habitat, and flood protection goals – three highly interrelated goals. High water quality will improve fishery habitat, and healthy riparian vegetation filters harmful pollutants from the water. And, environmentally sensitive flood management approaches improve both habitat and water quality.

A healthy creek provides excellent recreational and educational opportunities for watershed residents, which increases the visibility of the creek in the community. This in turn will make the creek a source of community pride and more likely to be protected and utilized as an asset in future development.

Pinole Creek Watershed Goals Relationship Model

GOALS:

WATER QUALITY
IMPROVE THE WATER QUALITY OF PINOLE CREEK WHERE MONITORING SHOWS THAT IT IS IMPAIRED.

HABITAT
RESTORE THE HEALTH AND QUALITY OF THE PINOLE CREEK ENVIRONMENT TO ENCOURAGE NATIVE HABITAT.

ENVIRONMENTAL EDUCATION
PROVIDE EDUCATIONAL OPPORTUNITIES TO THE RESIDENTS OF THE WATERSHED.

CULTURAL LANDSCAPE PRESERVATION
ENSURE THE UPPER WATERSHED RETAINS ITS RURAL CHARACTER.

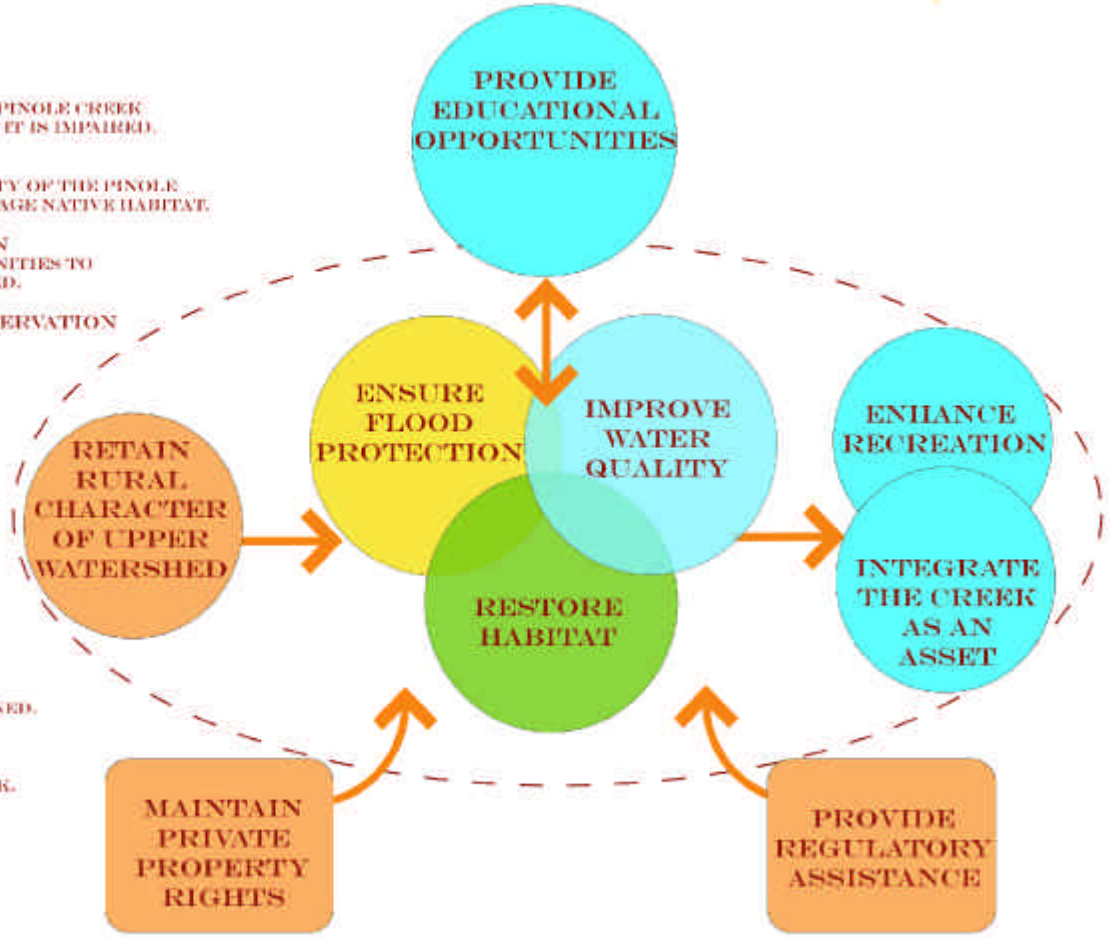
SMART DEVELOPMENT
ENSURE PINOLE CREEK IS COMPLIMENTED BY LOCAL DEVELOPMENT.

REGULATION
SIMPLIFY THE REGULATORY PROCESS FOR LANDOWNERS.

FLOOD PROTECTION
ENSURE GREATEST LEVEL OF FLOOD DAMAGE PROTECTION POSSIBLE.

PROPERTY RIGHTS
ENSURE THE RIGHTS OF PRIVATE PROPERTY OWNERS ARE MAINTAINED.

RECREATION
IMPROVE RECREATIONAL OPPORTUNITIES ALONG THE CREEK.



Appendix A

Funding Options - Lower Pinole Creek Restoration

	General Obligation Bonds	Parcel Tax	Benefit Assessment District
How are funds generated?	Increase in ad valorem tax on property	Tax on individual parcels. Possible for tax to be flat, per-parcel charge to vary tax by type of parcel and other factors	Assessment on property. Amount assessed is determined by engineers report that distributes costs according to benefits
Who pays?	Property owners. Properties with a higher net assessed value pay more	Property owners. Tax rates are determined within the measure by the framers	Property owners based on engineers report that distributes costs according to benefits
Who votes?	Registered voters	Registered voters	Property owners
What type of election?	Special or General Election	Special or General Election	Election by mail
What are the time constraints on the election?	Two elections per year, though odd years are more expensive	Two elections per year, though odd years are more expensive	Elections may be convened at any time. 45 days must be allowed for return of ballots
Costs of elections	Depends on how may items are on the ballot	Depends on how many items are on the ballot	Depends on how many parcels are included
OK to fund stewardship?	No	Yes	Yes
Fixed item requirement?	Yes	No	No
Expand revenues on a pay-as-you-go basis?	No	Yes	Yes
Possible to sell bonds?	Yes (required)	Yes	Yes
Advantages	* Simple * Only way to raise ad valorem tax * Best interest rate	* Possible to customize tax rate * Flexibility in use of revenues	* Perhaps more equity in distribution of costs * Flexibility in use of revenues * Elections may occur at any time
Disadvantages	* Not possible to manage funds on a pay-as-you-go basis * No stewardship * Even year election probably required	* Even year election probably required * Flexibility in tax rate structure can be point of controversy	* Application to county-wide open space needs is an emerging technique