Stream and Wetlands System Protection Policy Field Trip

San Francisco Bay Regional Water Quality Control Board

October 5th, 9:30 - 12:30

AGENDA

1. Organize carpool from old Alberton's on San Pablo Ave., travel to Baxter Creek at Poinsett Street	9:30 – 9:45
2. Baxter Creek at Poinsett Street site visit	9:45 – 10:30
3. Travel to Wildcat Creek at Church Lane	10:30 – 10:45
4. Wildcat Creek at Church Lane site visit	10:45 – 11:30
5. Travel to Wildcat Creek at North Richmond Ballfield	11:30 – 11:45
6. Wildcat Creek at North Richmond Ballfield site visit	11:45 – 12:30

DIRECTIONS

Meet at the old Albertson's at 12010 San Pablo Ave. near the corner of San Pablo and MacDonald Ave. in El Cerrito off HWY 80 a few blocks north of the El Cerrito del Norte BART station. Turn right on MacDonald Ave, left on Mono Ave, and right on Poinsett Ave. Continue past the playground and park anywhere on either side of Poinsett Park.

Continue to the end of Poinsett Park and make a u-turn onto Rosalind Ave. towards San Pablo Ave. Turn left on Carlston Street, right on Nevin Ave., and right onto San Pablo Ave. Continue on San Pablo Ave. for approximately 2 miles past Church Lane, take the next left into Alvarado Square, park at the south end and walk through the city vehicles/handicap parking lot to the footbridge over Wildcat Creek.
NOTE: BATHROOMS ARE AVAILABLE AT MAPLE HALL COMMUNITY CENTER IN ALVARADO SQUARE

Turn right onto San Pablo Ave. going back north bound. Take a right on Church Lane, Church Lane becomes Market Ave, turn right on 3rd Street, park after Wildcat Creek bridge next to North Richmond Ballfield on the right.

Directions to Freeway
Continue on 3rd Street, left on Pittsburg, take Richmond Parkway to HWY 80 or 580.

Directions to San Pablo Ave. Meeting Location and BART
Take HWY 580 east going towards Oakland, exit Bayview Ave. and turn left onto Bayview. Continue on Bayview, turn left onto 55th Street, right on Potrero, and left on San Pablo Ave. The El Cerrito del Norte BART station will be on the right, the old Albertson's at San Pablo and Ave. a few blocks further.

Effects of Urbanization

- Runoff increases
- Soil percolation decreases
- Evaporation decreases
- Transpiration decreases
- Bankfull and subbankfull floods increase in magnitude and frequency
- Dimensions of the stream channel are no longer in equilibrium with its hydrologic regime
- Channels enlarge
- Stream channels are highly modified by human activity
- Upstream channel erosion contributes greater sediment load to the stream
- Dry weather flow to the stream declines
- Wetland perimeter of the stream declines
- In-stream habitat structure degrades
- Large woody debris is reduced
- Stream crossings and potential fish barriers increase
- Riparian forests become fragmented, narrower, and less diverse
- Water quality declines
- Summer stream temperatures increase
- Aquatic diversity is reduced

U.S. EPA. 2006. *National Management Measures to Control Non-Point Source Pollution from Hydromodification*. Assessment and Watershed Protection Division, Office of Water, EPA 841-D-06-001. http://www.epa.gov/owow/nps/hydromod/. Accessed September 2006

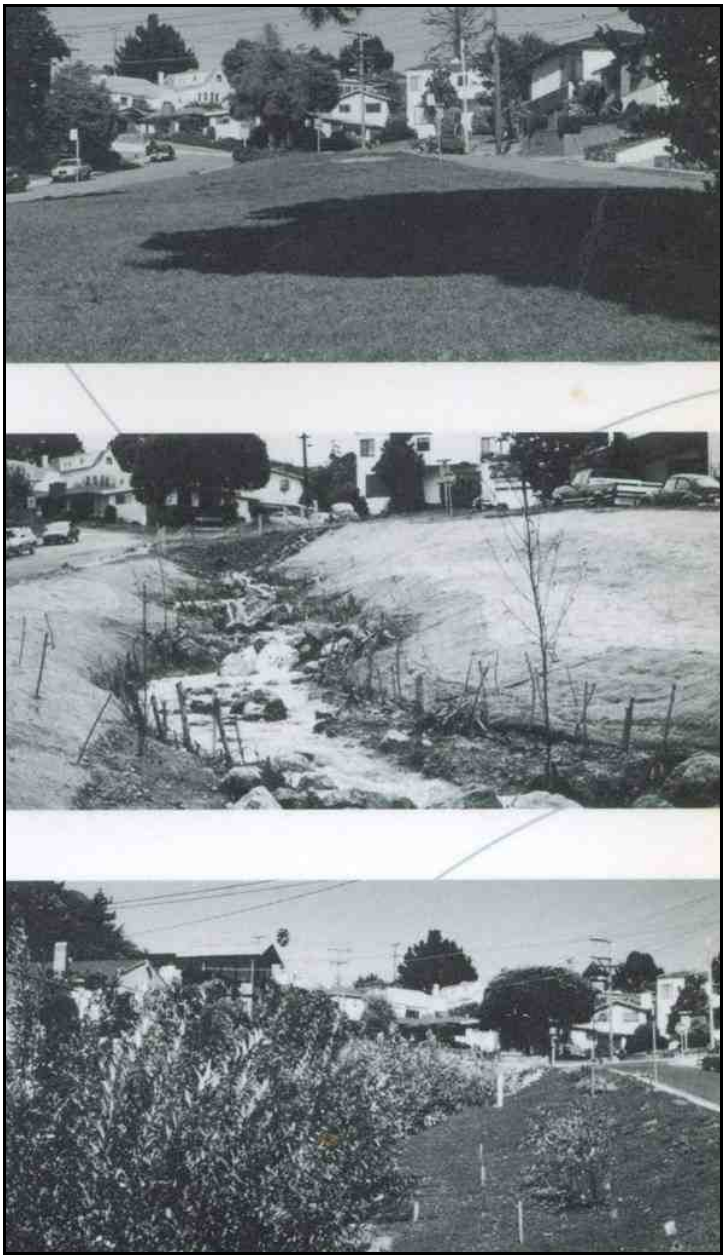
Benefits of Streambank Bioengineering

- Reinforcement of soil by roots (increases bank stability)
- Exposed stalks increase resistance to flow and reduce flow velocities, causing the flow to dissipate energy against the plant (rather than the soil)
- Intercepts water
- Enhances water infiltration
- Depletes soil water by uptake and transpiration
- Acts as a buffer against the abrasive effect of transported materials
- Close-growing vegetation can induce sediment deposition
- Often less expensive than most structural methods
- Improves conditions for fisheries and wildlife
- Improves water quality
- Can protect cultural/archeological resources

Allen, H.H. and J.R. Leech. 1997. *Bioengineering for Streambank Erosion Control: Report 1 Guidelines*. U.S. Army Corps of Engineers, Environmental Impact Research Program, Technical Report EL-97-8. http://el.erdc.usace.army.mil/elpubs/pdf/trel97-8.pdf . Accessed September 2006.

Baxter Creek at Poinsett Street

Baxter Creek, like many urban creeks, was put underground in a cement culvert to address flooding and sanitation concerns. In 1993, the El Cerrito City Council conducted a financial analysis of a broken culvert beneath Poinsett Park and determined it was more cost effective to “daylight” or open a 70 m section of underground culvert at the east end of Poinsett Park than to repair it over time. The Waterways Restoration Institute (WRI) designed and managed the restoration project. Because the creek was either channelized, highly degraded, or in underground culverts there existed no reference reach within the watershed; therefore the WRI estimated design channel dimensions using regional hydraulic geometry relationships between channel sizes and drainage areas. The WRI selected a channel sinuosity and slope to match a steep 10% valley slope. Due to the site's steep slopes, the creek was designed with a step/pool structure. It was planted with native willow, dogwood, and currant cuttings, as well as alders, big leaf maples, and other native trees.



Baxter Creek at Poinsett Street before, during, and after construction

Wildcat Creek at Church Lane

Objectives

This Urban Creeks Council project involved restoring fish and wildlife habitat and natural stream conditions and functions to a traditional flood control style section of channel. This project also aimed to reduce property damage from flooding and erosion and provide a stream resource amenity to downtown San Pablo.

Degraded Conditions

- The right bank had failing slabs of poured concrete and vertical corrugated sheet metal walls
- High flows were threatening to undermine a vertical concrete retaining wall on left bank
- Eyesore, due to the failing walls, the debris in the channel, and the dominance of exotic vegetation

Restoration Design

- Designed and built a dynamic equilibrium channel (bankfull channel), complete with a bankfull bench to restore the appropriate width-to-depth ratio and stream profile to provide efficient sediment transport
- Failing concrete weir removed and replaced with a hydrologically and ecologically superior cross vane rock structure enhancing fish passage and improving stream stability
- Restored natural vegetation, and added in-stream siltation baffles causing slower flows reducing streambank erosion
- Removed armoring (concrete) from left and right banks and performed various soil bioengineering techniques (willow brush layering, willow pole, willow brush mattresses, erosion control blanket) to stabilize banks
- Built a low bank terrace along the base of the existing concrete wall on the left bank in an effort to direct the thalweg away from wall and to induce some deposition
- Retrofitted banks underneath 3 existing stormwater outfalls along the right bank with willow fascines, riparian plants, and small rock aprons
- Mural installed on bridge highlighting the historic, cultural and ecological value of the creek and surrounding community

Wildcat Creek at Church Lane looking downstream before and after restoration

Wildcat & San Pablo Creeks Floodplain Restoration Project

The Wildcat Creek Restoration project is nationally known because it represents a pioneering attempt to substitute a conventional channelization flood control project with a project based on natural river science (geomorphic) principles. The project features an active, meandering channel, riparian forest and floodplain and has been the model for more environmentally sensitive flood control projects. The project has been monitored and modified over a period of sixteen years under the direction of a watershed council composed of all levels of government, elected representatives, non-profit groups, property owners, educators and general citizenry. The project thus serves as a case study in adaptive management from both a scientific and institutional perspective.

Objectives

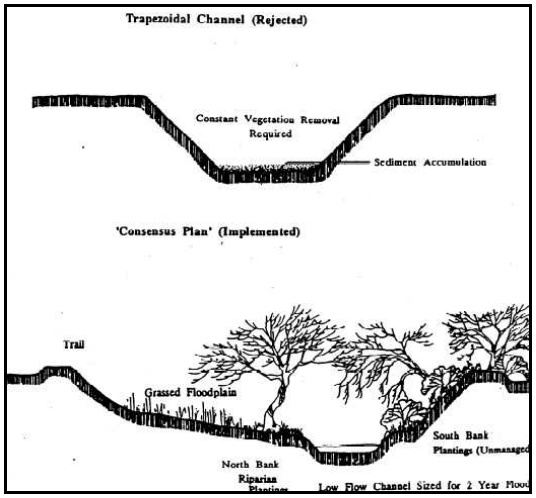
- Flood hazard reduction
- Restoration of natural stream channel and riparian trees
- Wetland protection and restoration
- Endangered species protection
- Development of regional trail and other outdoor recreation opportunities
- Environmental education
- Minimization of maintenance needs, costs, and impacts

Innovative Aspects

- Flood channels were designed to resemble natural channels
- Stable meandering low flow channels and riparian trees were used to minimize sedimentation and growth of clogging reeds
- The riparian environment was restored with a vegetation plan; the plan's maintenance schedule is based on the actual needs of the vegetation, rather that on regular routine

Accomplishments

- Citizen-based advocacy planning efforts led to a "Consensus Plan"
- The project required only a narrow 180-foot right-of-way
- The same level of flood protection was provided as in two earlier plans, one requiring a 250-foot right-of-way and one requiring traditional channelization
- Maintenance requirements, costs and environmental impacts were reduced
- A broad range of objectives made the project eligible for funding from agencies unable or unwilling to contribute to single-objective flood control
- Use of the consensus planning process produced an implementable plan and initiation of construction in two years, breaking a 29-year impasse



Wildcat Creek design comparison

Wildcat Creek multi-objective floodplain project