How Can I Get Involved?

We can continue to build community awareness and participation until long-term solutions are identified and implemented. Below are some additional resources and opportunities for involvement.

- Want to learn more about ways to reduce creek bank erosion? Visit the **Urban Creeks Council** website, *www.urbancreeks.org*, where you can find information about creek-friendly techniques to reduce erosion and stabilize banks (located on UCC's webpage for the Stream Management Program for Landowners).
- Want to find out about a local community effort to stop erosion and improve creek health in the Strentzel Lane neighborhood? Contact the **Alhambra Valley Creek Coalition** at *avcc@softcom.net*.
- Get your feet wet with **Friends of Alhambra Creek**! Volunteers carry out creek cleanups every spring and fall, water quality monitoring, creek surveys, and restoration projects. Contact *friendsofac@california.com*.
- Interested in environmental education? Join the **Alhambra Creek Restoration and Environmental Education Collaborative** (ACREEC), a group that involves students in hands-on environmental education, community service projects, and local restoration efforts.
- Have a question or concern about Alhambra Creek, or an idea for a watershed project? Come to an **Alhambra Watershed Council** (AWC) meeting on the first Tuesday of every month. The group acts as a resource for the community and develops watershed projects that implement the *Alhambra Creek Watershed Management Plan* (2001).
- Questions about creeks within the City of Martinez? Contact the **City Engineer** at 925-372-3515.

Visit the **Contra Costa Resource Conservation District** (CCRCD) website at *http://ccrcd.org* and click on "Alhambra Creek Watershed" for more information about volunteer activities and programs in the watershed.

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Living with Creeks

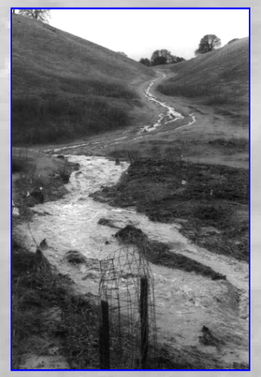
in the Alhambra Creek Watershed

A Publication of the City of Martinez Flood Task Force

November 2006

You and Your Urban Creek

Alhambra Creek flows through the heart of Martinez, bringing a bit of greenery and wildness to our urban neighborhoods. Healthy urban creeks provide many other benefits, including water supply and groundwater recharge, food and shelter for wildlife, and a conduit for floodwaters. But a degraded creek can also damage buildings and other property – especially during big storms like the New Year's storm of 2006. This brochure is intended to help you and your neighbors learn how to live in harmony with Alhambra Creek by providing information about how to manage problems such as erosion and flooding.

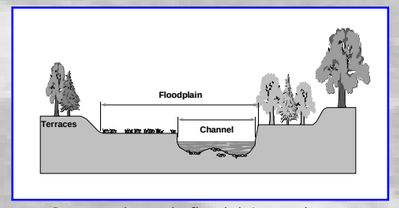


Floodwaters flow off Mt. Wanda, then slow down and spread out on Strentzel Meadow before reaching Alhambra Creek. January 1, 2006. *Photo: Jamie Menasco*

How Creeks Work

Creeks Move Water and Sediment

Large amounts of rainfall form streams in low-lying areas. Streams sculpt the landscape by carrying away sediment, rocks, and other material. This natural process is known as *erosion*. As creeks flow downstream, plants growing on the banks prevent excessive soil loss and slow down the flow of water. This allows sediment in the water to settle out in a process called *deposition*. Streams in their natural state are stable, maintaining a dynamic equilibrium between erosion and deposition.



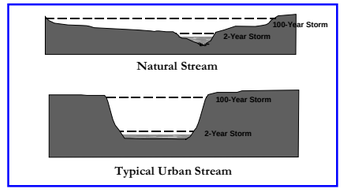
Stream channel, floodplain, and vegetation work together to convey stormwater and maintain a healthy creek. *Graphic: FMSM Engineers*

Creeks Need Space

In order to be stable and healthy, a stream needs an adequately sized *channel* and a *floodplain*. A channel must have the capacity to carry runoff from ordinary storms that occur every year or two. A channel that is too small will erode and destabilize the creek banks; one that is too big will partially fill in and reduce channel capacity. The floodplain is an area surrounding the stream that provides an area for flows from larger, less frequent storms, such as the 2006 New Year's storm, to spread out and slow down.

Erosion Damage

Many streams in our watershed are unstable because they do not have an adequately sized channel or access to their floodplain. To regain stability, creeks try to create a new floodplain. This process can cause many problems, including loss of land from the top of the bank, a lower water table (causing creeks to dry up in summer and drought stress to plants), and excessive sediment transported downstream.



(1) A typical urban creek cuts a deep channel and has no floodplain. *Adapted from FMSM Engineers*

Typically urban creeks cut deep channels in the surrounding land and no longer have floodplains (1). Confined by the channel, stream flows speed up and undercut the creek banks (2). The undercut banks will eventually collapse and cause the channel to broaden (3). As the banks fall in, large trees and structures can also fall into the creek (4). These materials may lodge in the channel, increase erosion, and form debris jams that cause flooding. Eventually, when the channel is wide enough, a new floodplain is created near the bottom of the channel. The creek regains a stable form, but may cause a great deal of damage to property, water quality, and habitat in the process.

(2) Confined channel leads to undercut bank in Alhambra Creek. *Photo: FMSM Engineers*

Individual property owners in the watershed have often tried to protect their creekside properties from erosion (5a, 5b). The success rate of piecemeal, improvised stabilization attempts is not high. In many cases structures meant to stabilize have been not only ineffective but detrimental, especially to other properties. The creek often works its way behind the structure and undermines it, causing it to fall into the channel. In addition to exposing the bare banks to further erosion, the fallen structure can increase erosion by redirecting stream flows toward the bank. The material in the channel also reduces its capacity, increasing the risk of flooding.

(3) Undercut banks fall in and cause channel to broaden in Alhambra Creek. *Photo: FMSM Engineers*

Attempts to stabilize the creek by placing materials into it decreases the capacity of the channel and makes the problem worse. A constricted channel backs up water, raises the risk of flooding upstream, and increases erosion downstream by speeding water through the constriction—much like placing a thumb over the outlet of a hose causes the water to shoot out in a stream.

(4) Widened channel causes trees to fall into Alhambra Creek. *Photo: FMSM Engineers*

(5b) Gabions constructed on Alhambra Creek bank can make erosion and flooding worse. *Photo: FMSM Engineers*

(5a) Plastic on Alhambra Creek bank can fall in and worsen erosion. *Photo: FMSM Engineers*

Flood Damage

Much of the development in the watershed exists in the "100-year floodplain" (see the *Alhambra Creek Watershed Map**). This means that the odds of flooding within this area in any given year are one in 100, based upon historical data. Some locations within this floodplain are more vulnerable and can be flooded by lesser storms. The 2006 New Year's storm which caused substantial damage in the watershed was classified as a 40-year storm event.

Development in the watershed has increased the amount of land covered by roofs, streets, buildings, and parking lots. These *impervious surfaces* prevent water from soaking into the ground, causing it to run off instead. Even a small increase of impervious surface can substantially increase the peak flow and runoff from a given storm, such that runoff from a smaller storm can now inundate the "100-year floodplain."

How to Manage Flooding and Erosion Problems

Excessive erosion and increased flooding are not inevitable. The watershed is an integrated system. Changes in one part affect other parts. In order to reduce erosion and flood damage, we need to find large-scale, system-wide solutions. Identifying and implementing these solutions will take time, community cooperation, and money. In the meantime, individual property owners can take steps to enhance creek function and minimize damage.

Large-scale Solutions

- Reduce impervious surfaces (e.g., pavement) to reduce the amount and speed of runoff in the watershed.
- Provide areas for runoff to sink into the soil, such as vegetated swales and detention basins.
- Create adequately sized stream channels that can carry runoff from one- to two-year storms.
- Provide "least harm" overflow areas for floodwaters.
- Allow creek to access its floodplain in ways that do not result in damage.

Friends of Alhambra Creek volunteers restore native plants at Strentzel Meadow.

What You Can Do

- Avoid diverting water or damming the creek.
- Inspect creeks for potential blockages, and remove items that obstruct, divert or constrict stream flow. Do not throw trash or yard debris into the creek.
- Avoid locating structures near the creek bank and in the flood zone.
- Allow runoff to soak into the ground by paving areas only when necessary. Consider alternatives that increase permeable surface area to allow infiltration.
- Establish plants with deep root systems, such as willows, on channel banks to increase stability.
- Route roof drains over vegetated areas rather than directly to streets or storm drains.

We can achieve greater success in managing flooding and erosion problems by analyzing the characteristics of the channel, applying knowledge gained in recent years about how creeks work, and making changes such as those listed above to create a stable, healthier creek and watershed.

**Contact the Contra Costa Resource Conservation District (see back) to obtain the watershed map.*