



*When you plant and maintain native riparian vegetation, you help to minimize erosion and maximize the likelihood that your property will remain intact during a flood.*

While property loss during the 1995 and 1998 flooding was sudden and dramatic, it's important to know that if your banks are unprotected, you are losing your land to erosion every day, even during relatively low flows.

It's easy to conclude that high river flow causes erosion, but the true causes are usually lack of protective bank vegetation or instability upstream.

Our native streamside plants, especially willow trees, are your first line of defense against property loss. The branching roots and fibers that make up riparian root systems hold soil together at streamside and extend far back from the banks to provide natural protection. During floods, the leaves and branches of plants slow the velocity of stream flow and reduce the erosive force of the river against the banks.

Banks with healthy native vegetation often remain unchanged even when deeply flooded.

Quick-growing native trees provide an amazingly high level of protection even as young saplings. Planting is also the cheapest, quickest way to protect yourself—it requires no permits, and free cuttings and planting guides are available from the Monterey Peninsula Water Management District.

Streamside vegetation also provides wildlife habitat and deep, shady pools for fish, while at the same time enhancing views and property values.



This photo shows a willow sapling and the curve of the unprotected, eroded bank upstream from the tree. Even though the willow is only a couple of years old, it has already saved a large area of bank from erosion.

Neighbors must cooperate to create a continuum of bank protection. This bank restoration project shows newly planted willow cuttings taking root. With irrigation during dry periods, these fast-growing native trees will provide a high level of bank protection in just a few years, while at the same time increasing aesthetics, wildlife habitat, water quality and property value.

## A word of caution about rock rip rap

Severely eroded, extremely unstable banks may warrant using large rock or other acceptable material along with vegetation—a technique which requires permits and heavy equipment. Merely dumping rip rap over the bank will usually create more erosion problems instead of solving them.

To be effective, a bank stabilization project must be carefully designed and built. Results can vary greatly depending on rip rap size, type and placement; bank preparation; degree of stabilization; use of filtering materials; conditions up and downstream, etc.

Improperly installed, rip rap can do more harm than good. And even if your project is sound there are no guarantees.

Any bank can be compromised if sufficient erosion occurs upstream to alter the natural flow of the river. If your neighbors' streambanks fail, stream flows can erode your banks and eventually undermine your rip rap from beneath or behind.

To save time and expense, call [the experts at] MPWMD for advice before you invest. A bank stabilization technique other than rip rap may be more cost-effective for your unique situation.



Stabilization will only prevent erosion if the correct technique is chosen, and then properly installed.

Whatever stabilization technique you use, it should always be installed along with native trees. Vegetation covers rock rip rap and other structures quickly to increase bank protection and provide the aesthetics, improved water quality and wildlife habitat that exposed rock cannot contribute.



Photo credits: cover photo, MPWMD staff; pages 2-3—wildlife photos, Anne Muraski; river photos, MPWMD staff; pages 4-5—river and wildlife photos, Anne Muraski; page 6-7—steelhead photo, MPWMD staff; frog, courtesy U.S. Fish and Wildlife Service; page 8—owl, Anne Muraski; river cleanup photo, MPWMD staff



## Flood Checklist: preparing your home

- Store valuables on high shelves.
- Create a list of the most important portable items you'll want to take with you in case of evacuation (photos, keepsakes, documents, keys, home inventory, medicines, jewelry etc.). Store them near each other for easy collection.
- Keep a home inventory at another location.
- Elevate or secure large equipment such as washing machines, water heaters, furnaces, television, etc.
- Evaluate each room to see how quickly you could move belongings out of harm's way. You may want to add high shelving, store collections in one moveable box, or install casters on hard-to-move furniture.
- Inspect your home for ease of cleanup. Use area rugs over tile or linoleum instead of wall-to-wall carpeting. Smooth wall surfaces are easier to clean and disinfect than textured ones.
- Have a family evacuation plan: where to meet, quickest escape routes, etc.
- Keep carriers, leashes and food for your pets in a handy location.
- Maintain an emergency kit: flashlight, radios, fire extinguisher, drinking water, food supply, first aid kit, tools, all-weather gear.
- Consider installing gates in fences so flow and debris can pass through during flooding.
- Keep important items on hand:
  - First aid and survival guide
  - Instructions on how to turn off utilities
  - Emergency phone numbers
  - Emergency broadcast frequencies
  - Sandbags (available at fire stations)

## The river joins all who live along it: how the cycle of erosion works

Whenever you alter the riverbank, you set forces in motion that also alter your neighbor's banks—for better or worse.

Improperly stabilizing your bank or deflecting flows away from your property even slightly can change river hydraulics and increase flow velocity and erosion downstream.

When the river deposits eroded material in gravel bars downstream these obstructions deflect water flow into your neighbor's banks, causing more erosion and gravel bars as the cycle continually works its way downstream.

Contact MPWMD before altering your streambank to make sure you're not transferring your problem to someone else.

- Benefits of native streamside vegetation:**
- Protects property
  - Relatively inexpensive
  - Easy to install
  - Requires no permits
  - Prevents erosion
  - Stabilizes banks and slopes
  - Reduces stream flow velocity
  - Provides habitat for wildlife
  - Enhances property values
  - Improves aesthetics
  - Supplies nutrients
  - Improves water quality
  - Shades and cools water
  - Provides fish habitat