

Streambank Erosion:

A Resource Guide for Sonoma County Residents with Streamside Erosion Concerns

What is streambank erosion?

Streambank erosion refers to the removal of soil and other material, such as rock and vegetation, from the streambank. While this is a naturally occurring process, the rate at which it occurs is often increased by human activities such as urbanization and agriculture. Changes in land use can cause streambanks to erode at rates much faster than those seen in natural, undisturbed systems. Streams and streambanks are dynamic over time and interventions are not always warranted.

Streams in urban areas are susceptible to failure due to the amount of impervious surfaces that decrease water infiltration and thus create more runoff flowing at higher and stronger rates through urban streams.

What causes streambank erosion?

Streambank erosion such as slides, slumps, or bank collapse, is typically caused by:

- The bank being undermined at the bottom (toe) of the slope, causing the soil to slide or slump down, typically due to increased runoff/flow, loss of vegetation/trees, natural migration of the streambed.
- The top of bank being saturated due excessive runoff with strong erosive forces resulting in an unstable bank, prone to failure
- Obstruction (debris jam, downed trees, etc.) in the channel that diverts flow into the streambank

How can streambank erosion or failure be repaired?

A temporary solution is to cover erosion with a tarp or biomass (i.e. rice straw, jute netting, etc.). This will reduce further erosion from rainfall and runoff until a permanent solution can be installed. The following page contains a table with options for restoration. A qualified professional should always be consulted. You can contact the Sonoma RCD for more information.



***Permits are required for any earth-moving within the creek, and installation typically requires a qualified contractor. See Page 3 for more information.*

Streambank Erosion Restoration Options

<p>Vegetative Stabilization (With No Grading)</p> 	<p>Use a mix of native riparian plants and trees along the sides and top of the bank to improve stability. Temporary irrigation is often required until plants are established. Biodegradable erosion control fabrics may be used for short-term stabilization during the establishment period.</p>	<p>Pros: Cost-effective, slows erosion with minimal soil disturbance, provides habitat and ecological benefits</p> <p>Cons: Establishment takes multiple years; provides short-term to moderate stabilization; continued erosion may still result in bank loss</p>
<p>Bank Re-Grading with Native Planting</p> 	<p>Re-grade bank to gentler slope to improve long-term stability, then plant native riparian vegetation. Slopes of 2:1 or gentler are ideal for soil stability; while 3:1 slopes better support plant establishment. Similar to the above option, temporary irrigation is often required until plants are established. Biodegradable erosion control fabrics may be used for short-term stabilization during the establishment period.**</p>	<p>Pros: Creates safer, more stable banks; provides longer-term erosion control; minimizes loss of land and habitat</p> <p>Cons: Moderate upfront financial investment; potential soil compaction from heavy equipment; longer timeline due to planning and permitting</p>
<p>Streambank and Channel Re-Engineering</p> 	<p>Re-engineer the streambank and channel using engineered stabilization techniques. May include reinforcing the bank toe and face with rocks, logs, or live willows, re-grading the upper bank, and planting native riparian vegetation. Requires project design, permitting, and installation by qualified professionals.**</p>	<p>Pros: Provides the highest level of long-term bank stability; improves safety in areas of severe or active erosion; enhances riparian and instream habitat</p> <p>Cons: Highest upfront financial investment; potential soil compaction from heavy equipment; longest timeline due to design, planing, and permitting; adjacent land may be converted to support creek restoration</p>

Streambank Erosion Restoration Permits & Contacts

What permits are needed?

Contact local California Department of Fish and Wildlife (CDFW) and California State Water Resources Control Board offices to get their recommendation on permitting requirements for repair projects. Below are common permits needed, others may be required, and agency contact information:

Permitting Info:

- California Department of Fish and Wildlife - [Fish and Game Code Section 1602](#)
- State Water Resources Control Board - [Section 401, Clean Water Act](#)
- Army Corps of Engineers - [Section 404, Clean Water Act](#)
- County of Sonoma - [Grading Permit and Riparian Zoning Permit](#)

Contact Info:

California Department of Fish and Wildlife Bay Delta Region	(707) 428-2002	askbdr@wildlife.ca.gov
Water Regional Board 2: San Francisco Bay	(510) 622-2300	b2-sfbay- contactus@waterboards.ca.gov
Water Regional Board 1: North Coast	(707) 576-2220	NorthCoast@Waterboards.ca.gov

What agencies can offers support?

Streambank restoration funding specifically to protect property, homes, or infrastructure is rare. The below organizations may be able to offer financial or technical assistance and at a minimum, connect you with the right professionals or groups.

Except under very limited circumstances, [Sonoma](#) and [Gold Ridge](#) Resource Conservation Districts (RCDs) are not able to provide free services for streambank erosion but may be able to assist on a fee-for-service basis with the following: planning and or design, technical site visits, permitting assistance, and technical assistance. Occasionally they can obtain implementation funding through competitive grants.



Streambank Erosion Restoration Resources

Santa Rosa Creek Stewardship Program: Proactive volunteer community that works on projects to protect wildlife habitat and address natural resource concerns such as illicit dumping, water pollution, erosion, and growth of non-native invasive plants.

Sonoma Ecology Center: Has occasional funding and established partnerships for restoration projects in the Sonoma Creek watershed to promote fish habitat and improve streamflow.

Sonoma Water: If on an Engineered Flood Control Channel, Sonoma Water may perform work under scope covered by their Stream Maintenance Program. More information on the Stream Maintenance Program (SMP) is available [HERE](#).

Point Blue STRAW Program: Applicable for landowners interested in revitalizing their stream bank with local schools. Can reach out about becoming a potential site at info@pointblue.org.

Additional Resources

[Groundwork - A Handbook for Small Scale Erosion Coastal California](#), Marin RCD

[Permitting Guide for Conservation Projects](#), Sonoma RCD

[Recommended Plants for Sonoma County for Erosion Control](#), UCANR Master Gardeners Program

[Slow it. Spread it. Sink it. Store it! - A Guide to Beneficial Stormwater Management and Water Conservation Strategies](#), Sonoma RCD

