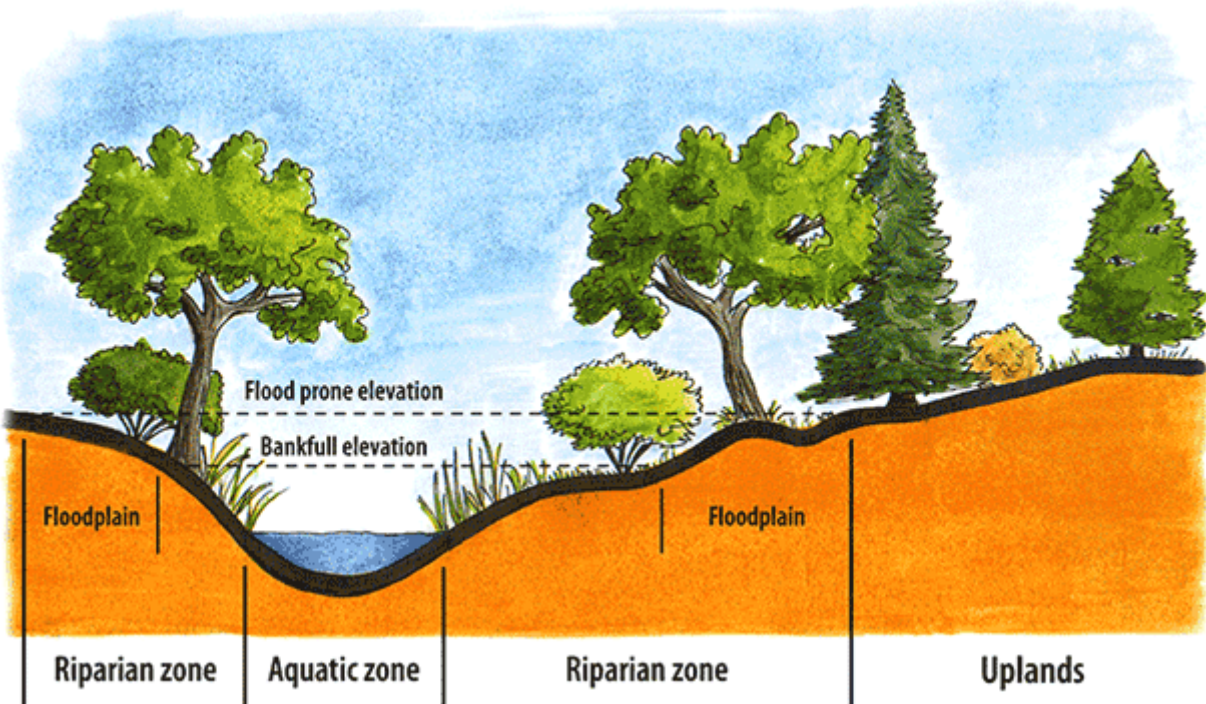


Stream Maintenance

Preparing Creeks before the Rainy Season

This document is intended to provide guidance to municipalities, Community Service Districts and private property owners that live along creeks. This document is for use in urban streams that are flood prone and fall within existing zones at the Marin County Flood Control District (see map titled '*Flood Control Zones in Marin County*').

'*Riparian Zone*' or '*Riparian Area*' or '*Riparian Corridor*' is the interface between a stream and the upland area of land that includes hydrophilic (water-loving) vegetation supporting an array of beneficial services. Some benefits include; pollutant filtration, creek bank stability, habitat and food for wildlife (i.e. hazelnuts, bay nuts, nectar, thimbleberries, etc.), stream channel complexity, heat refugia, protection from predators, erosion control, migratory corridors, input for nutrient cycling (leaf litter and insect-drop), air quality, and more.



The Law

It is a violation of Marin County Code and CA Department of Fish & Wildlife (CDFW) Code to remove native riparian vegetation without a permit (1602) or RMA (Routine Maintenance Agreement) in place from CDFW. Maintenance of a majority of the creeks in Marin is the responsibility of the neighbors whose properties border the creek and it is their responsibility to secure the necessary permits in advance of work in or around creeks. Start the permitting process early as permits can take at least 60-90 days to process and secure. While it may be

¹ Source: <http://slco.org/watershed/streams-101/the-riparian-zone>

within a County Flood Control Zone, the County has easements on some but not on every creek. CA Civil Code Section 830 says in summary: *homeowners are responsible for creek care, bordering a non-navigable stream where there is no tide, from the middle of the stream channel to their creek bank or to both banks if they own both sides of the creek. The purpose of the Code is to ensure flows are not impeded in order to reduce flooding.*

Timing

The best time of year for creek “cleaning” or rather, “preparation” activities is in September and early October, before the rainy season. There are many reasons to carry out these actions in a timely manner:

- Once it rains, everything drains from the landscape into the waterways, which impairs water quality.
- Once the creek is flowing, removing trash becomes a safety hazard.
- Starting as early as December, many of Marin’s watersheds have federally listed steelhead trout migrating from the ocean to spawn (reproduce) in the upstream reaches of the creeks. Starting as early as October, some creeks will also have federally listed coho salmon migrating upstream to spawn. For their protection and safety, please stay out of the creeks.



Image 1: Litter adds up and can clog culverts causing flooding



Image 2: Branches that obstruct flow should be removed to prevent floods



Image 3: Neighbors coming together in east Marin to clean their creek

The Do's

- 👉 Remove obstacles from the creek channel; wood panels, stream crossing boards, toys, litter, debris, etc. (see image 1)
- 👉 Remove low-hanging branches or fallen trees that would otherwise impair or obstruct creek flow during storm events (see image 2). Note, wood is great instream habitat for salmon and trout but are not permitted in flood control areas in order to protect homes and infrastructure from flood damage. Refer to map ‘*Flood Control Zones in Marin County*’ at the end of this document to see if your creekside parcel is within such a zone.
 - If the tree branches are not going to come in contact with the water (i.e. overhanging vegetation) then **do not** remove them. They contribute to ‘canopy cover’ and provide the following benefits:

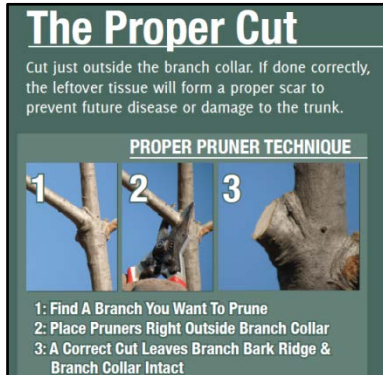


Image 4: The proper method to cut and limb branches

- *Shade* – keeps water temperatures cooler. Warm water is lethal for many aquatic organisms, such as Marin’s endangered and threatened salmonid species.
- *Dissolved Oxygen* – cooler water temperatures enable more oxygen to be available for aquatic organisms, necessary for respiration.
- *Nutrient Cycling* – leaf litter drops in to decay and becomes a vital food source for insects such as benthic macroinvertebrates (BMIs), which are then food for aquatic organisms such as salmon.
- *Food* – insects drop in from overhanging branches to feed salmon and amphibians.
- *Habitat* – birds and many other animals thrive in riparian environments and use them as migratory corridors.

- Cut branches just outside the collar for the health of the tree, preventing the potential for plant pathogens and diseases to do harm (see image 4).

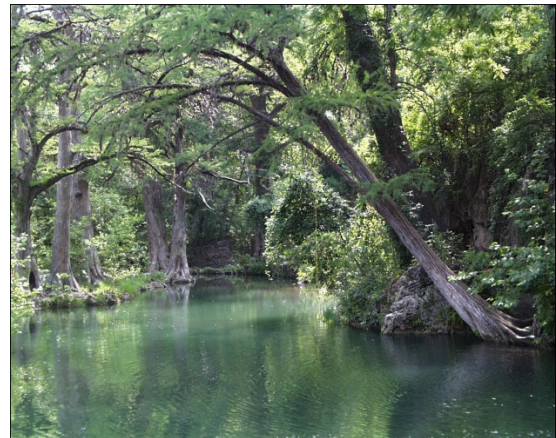
- ☞ Remove hazardous materials from the riparian area and store them in a safe place or dispose of them properly by visiting this website to locate your closest drop off location: <http://zerowastemarin.org/residents/household-hazardous-waste/>.
- ☞ Report illegal discharges of pollution into streams by contacting Marin County Stormwater Pollution Prevention Program (MCSTOPPP) or SF Regional Water Quality Control Board (RWQCB).
- ☞ Many hands make light work: Invite your neighbors to work together on a ‘creek clean-up day’ where everyone can lighten the load by pitching in together (see image 3).
- ☞ Remove non-native invasive vegetation when possible. Non-natives harm a watershed by displacing native vegetation that local wildlife relies on for survival. Employ erosion control measures upon invasive species removal to keep fine sediment from impairing water quality.
 - Remove non-natives during spring while the ground is still soft but the rains have finished, reducing the chance of erosion allowing fine sediment to enter the waterway.
 - Plant native riparian species in fall during the wet season to help them become established. Natives may need additional water in summer until they become fully established.

The Don’ts

- ☞ Do not remove native vegetation unless necessary as native riparian vegetation is critical to a healthy functional stream. Follow this link: http://www.marinrcd.org/wp/wp-content/uploads/2015/02/Go-Native_2013_MCSTOPPP.pdf to view a booklet about Marin’s native vegetation.

- 👉 Do not denude a creek bank in effort to speed up conveyance. If the banks are not vegetated, they will erode, leading to landslides and bank failures that fill up the creek with sediment, reducing the volume available to carry flow.
- 👉 Do not straighten creek channels out as that speeds up the water that in turn exacerbates creek bank erosion, incision and can lead to flooding downstream areas.
- 👉 Do not leave or place yard clippings/yard waste in or near the creek.
- 👉 Do not spray herbicide or pesticide near a creek as they are toxic to aquatic organisms.

Good for Bank Stabilization, Conveyance, and Shading of Water



Protecting Your Streambank

A majority of creek banks in Marin are subject to erosion, especially those on the outside bend of a stream AND those lacking vegetation such as native riparian trees where the robust root system holds the soil in place, protecting the bank (see images above). The best techniques to use, that promote a healthy riparian corridor, include soil bioengineering methods which are considered 'soft engineering' that are eco-friendly and nature-based solutions to creek bank erosion. Some examples of these techniques include but are not limited to;

- Willow/dogwood staking & sprigging (note: willows prefer sun and dogwoods prefer shade)
- Willow/dogwood walls
- Brush layering*
- Willow/dogwood mattress
- Laying the bank back to a 2:1 slope then vegetating it with natives*
- Using large pieces of wood to deflect flows away from the toe of your bank*

* These activities will necessitate engineered designs. Contact Sarah Phillips for a list of *Creek-Friendly Engineers* Sarah@Marinrcd.org. Learn more about willows in Marin County by visiting

this website: [http://www.marinrcd.org/wp/wp-content/uploads/2015/02/Common-Willows-of-Marin -S.Phillips FINAL.pdf](http://www.marinrcd.org/wp/wp-content/uploads/2015/02/Common-Willows-of-Marin-S.Phillips_FINAL.pdf).

Permitting and Regulations (i.e. all the **RED TAPE**)

Any work performed in or near a creek (perennial, ephemeral or intermittent) will likely require a permit from at least one regulatory agency. If you are in unincorporated Marin, most actions carried out within or near the creek channel will require a Creek Permit which can be obtained through Marin County's Department of Public Works, Land Development Division. To confirm whether you need a permit, contact them directly at 415-473-6549. If you live in an incorporated area of Marin, contact your local Department of Public Works to confirm whether your proposed actions will or will not trigger permitting.

Other regulatory agencies to check in with **before** you carry out any work around any waterway, whether it flows year-round (perennial) or only seasonally (ephemeral & intermittent);

- Army Corps of Engineers, *Roberta Morganstern*,
Roberta.a.morganstern@usace.army.mil, (415) 503-6782
- SF Regional Water Quality Control Board, *Nicole Fairley*,
Nicole.Fairley@Waterboards.ca.gov, (510) 622-2424
- CA Department of Fish & Wildlife, *Karen Weiss*,
Karen.Weiss@wildlife.ca.gov, (707) 944-5525

If ever in doubt, Marin County offers FREE monthly meetings where you can discuss your proposed actions with the appropriate regulatory authorities in a non-formal setting to determine which permits you will need and how best to proceed with your project. To get on the *Marin Project Coordination* meeting agenda, contact Howard Bunce at Marin County Stormwater Pollution Prevention Program (MCSTOPPP) at HBunce@marincounty.org or (415) 473-3748.

Key Watershed Contacts

Marin County Flood Control, Bene Da Silva, BDaSilva@marincounty.org (415) 473-6538

Marin County Flood Control, Gerhard Epke, GEpke@marincounty.org (415) 473-6562

Marin County Flood Control, Alekz Pang, APang@marincounty.org (415) 473-2667

Marin County Watershed Program, Liz Lewis, LizLewis@marincounty.org (415) 608-8688

Marin County Stormwater Pollution Prevention Program, Howard Bunce,

HBunce@marincounty.org (415) 473-3748

Marin Resource Conservation District, Sarah Phillips, Sarah@marinrcd.org (415) 663-1170

Local Watershed Groups

Gallinas Watershed Council, <https://www.gallinaswatershed.org/>
Miller Creek Watershed Stewards, <http://www.millercreekwatershedstewards.org/>
Friends of Corte Madera Creek, http://friendsofcortemaderacreek.org/new_site/
Friends of Novato Creek, <http://www.novatocreek.org/>
Friends of the Creek (Sausalito), <http://www.friendsofthecreek.org/>
Mill Valley StreamKeepers, <http://www.millvalleystreamkeepers.org/>
SPAWN, <https://seaturtles.org/programs/salmon/>
Watershed Alliance of Marin, <https://www.watermarin.org/>
Tomales Bay Watershed Council, <http://www.tomalesbaywatershed.org/>

Learn More!

General Creek Guidance

Various Creek Information per Marin County:

<http://www.marincounty.org/depts/pw/divisions/mcstoppp/general-public/creeks-and-watersheds>

Sonoma County Water Agency:

http://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2011/April/SCWA/Stream_Manual.pdf

Regional Water Quality Control Board:

http://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2014/April/7.pdf

Best Management Practices for Stream Protection: <http://www.fayetteville-ar.gov/DocumentCenter/Home/View/1556> (*note pg 17 lists species for Arkansas, please plant according to native species for Marin County with guidance provided below)

Plethora of Resources on Marin RCD's Urban Streams Coordination Page:

<http://www.marinrcd.org/resources/>

Regulatory

Marin County Creek Permit Guide:

<https://www.marincounty.org/~media/files/departments/pw/mcstoppp/residents/creek-permit-guide.pdf?la=en>

State and Federal Regulatory Guide for Creeks:

http://www.swrcb.ca.gov/sanfranciscobay/press_room/documents/Stream_Maintenance_Enhancement_Fact_Sheet_Final.pdf

Erosion Control and Native Plants

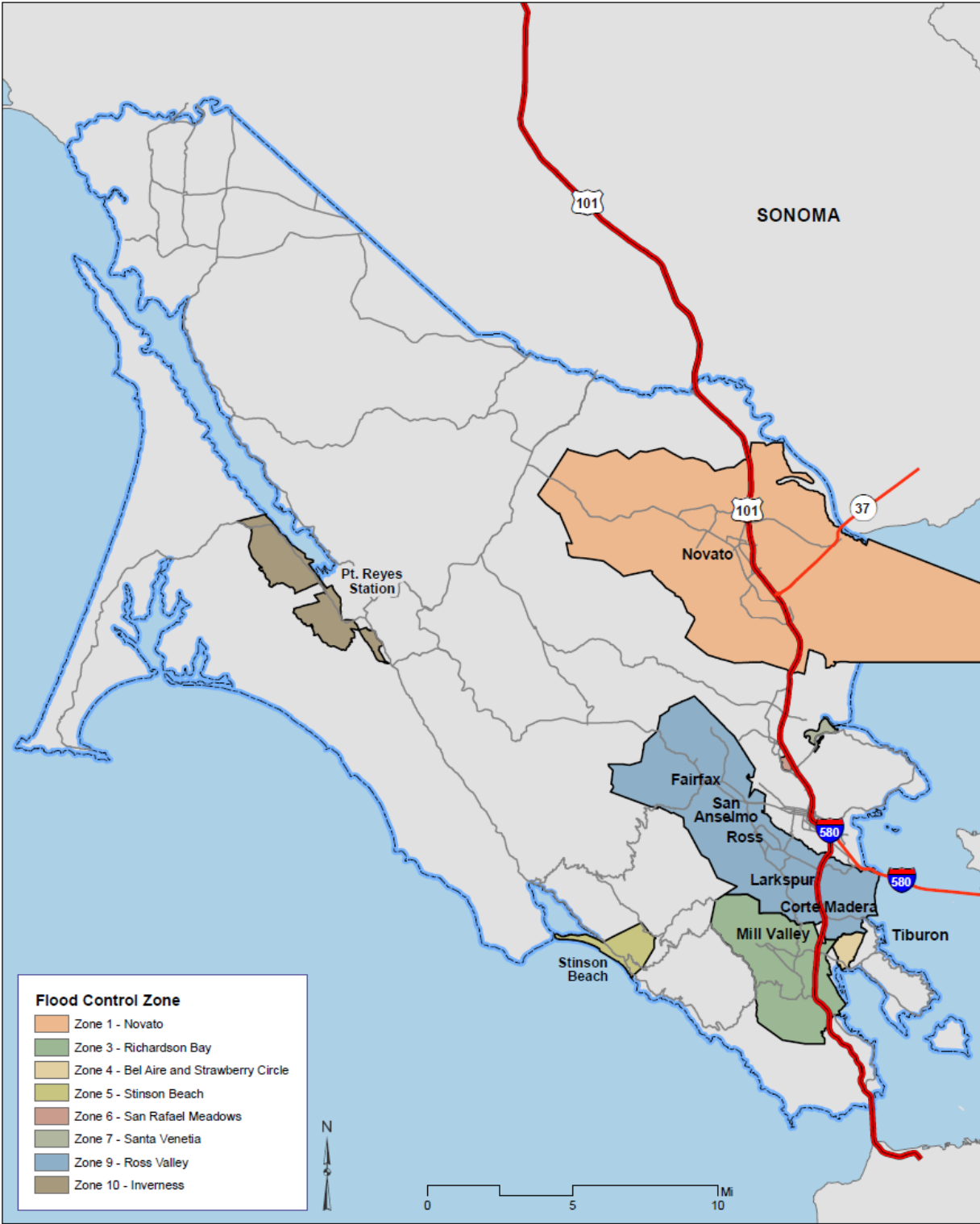
Small Scale Erosion Control: <http://www.marinrcd.org/wp/wp-content/uploads/2014/01/Groundwork-A-Handbook-for-Small-Scale-Erosion-Control-in-Coastal-California.pdf>

Go Native Booklet:

<https://www.marincountyparks.org/~media/files/departments/pw/mcstoppp/residents/go-native-2013.pdf>

CA Native Plant Society's Marin Chapter: <https://www.cnpsmarin.org/>

Flood Control Zones in Marin County²



Flood Control Zones

County of Marin
 Department of Public Works
www.marinwatersheds.org



² Map can be found online at: http://marinwatersheds.org/sites/default/files/2017-05/FC_All.pdf