Stream Care Management Guide for Streamside Property Owners

Our waterways comprise an invaluable resource by providing water supply, wildlife habitat, a conduit for flood waters and, for those of us along the creek, a host of aesthetic and recreation values. Even ephemeral stream channels are important since they feed into larger streams and they provide amphibians with a safe place to breed without the presence of fish predators.

Much of the responsibility for the life and health of our streams rests with you, the streamside resident or property owner. The stream you share lies within one of several major watersheds, or natural drainage basins within the western Sierra Nevada foothills.

The streamside management you practice will likely affect a much greater area than you think – it is important to recognize that activities or conditions anywhere within a watershed can influence the condition of the stream itself.

Proper management of the stream bank and its vegetation can prevent or minimize erosion, preserve water quality, contribute to the survival of the area's fish and wildlife, mitigate droughts, and help avoid flood losses.

With knowledge of the principals of stream care, taking care of our creeks and streams is easy. With a little care, you can protect and enhance your streamside environment, protect wildlife habitat, and help preserve the heritage of productive streams, flowing free and clear.

THE PRINCIPLES OF PROPER STREAM CARE ARE SIMPLE:

1. DO NOT ALTER THE STREAM BED, OBSTRUCT, OR DIVERT THE FLOW OF WATER

Avoid removing natural debris from the stream channel unless it poses an erosion or flood hazard. Natural woody debris in the stream channel is often necessary for a healthy fish population. Cleaning the woody debris from a stream usually hurts rather than helps fish and wildlife. If fallen logs or brushy debris are causing rapid erosion of the bank by directing stream flow into the bank, or posing an imminent flood threat or an insurmountable barrier to spawning fish, contact *Nevada County Public Works* and the *California Department of Fish and Game.*

Alteration: You must obtain a *Stream Alteration Agreement from the Department of Fish and Game* before modifying a stream in any way, including digging in the stream bed, putting anything in, or taking anything out of a stream (even if you think there is an existing barrier to fish migration in your stream).

Dams: All instream structures require a *permit* from the *Department of Fish and Game* to build, maintain, and dam a stream. Owners must comply with *Department of Fish and Game regulations* concerning these structures.

Diversion:
Avoid diverting water from the stream. The amount of life a stream can support is directly related to the amount of water in it; small streams can be heavily impacted by even small water diversions.

Legally, you must obtain a *water rights permit* to divert a stream, and you must leave plenty of water to fulfill the needs of downstream water users. With the proper permits, some residents may draw water directly from a stream. However, each year large numbers of juvenile fish are lost to unscreened water diversions. If you have a permit to pump from the stream, remember to cover the intake diversion pipes with a 1/8-inch mesh hardware cloth screen to prevent fish and other

creatures from being sucked in. Screening also reduces the cost of cleaning out the diversion of fish or other debris.

Encroachment into riparian corridor:
Any structure built within the reach of an over-flowing stream is not only subject to damage or loss but may actually decrease the stream's ability to safely accommodate floods by removing protective vegetation and destabilizing vulnerable slopes. In keeping with the value of the riparian zone, avoid building any structure there — even decks, patios, or retaining walls.

County ordinances regulate all building in the flood plain. The safest advice for your property and your stream is to maintain the flood zone in its natural state. For new construction, contact the *City or County planning department* regarding setbacks and other requirements. If you are proposing to place any fill in a waterway contact the *Army Corps of Engineers*.

2. MAINTAIN STABILITY OF STREAM BANKS, AND PROTECT/RESTORE RIPARIAN CORRIDOR

Leave streamside vegetation intact: Avoid "improving" your creekside area by mowing, clearing, or stripping vegetation. Riparian vegetation provides important stream bank stabilization – the roots of streamside trees, vines, and shrubs bind the soil together, and grasses and other vegetation protect the banks from erosion. A healthy stream bank needs undisturbed soil and native vegetation. A healthy riparian corridor can also act as a sediment and nutrient screen, filtering silt from adjacent property and absorbing some nutrients released by septic systems. However, to be an effective screen, this zone of vegetation must be sufficiently wide (approximately the width of the 100 year flood plain). Native trees, shrubs, vines, and grasses should all be present, and within that zone, nothing should be disturbed.

Flooding: A naturally vegetated stream bank is your property's best protection against flooding. The native riparian plants growing there are uniquely adapted to surviving flood conditions, providing erosion protection at high flows, and recovering quickly when flood waters subside.
(See also #5. Storm Water Management)

Native plants: A variety of native plants along a stream create good riparian habitat. Riparian plants not only provide critical wildlife habitat, they also directly affect living conditions in the stream itself. Streamside plants provide shade, lower water temperature, and create hiding cover for fish and other organisms , while plant roots stabilize the bank, preventing erosion.

Streamside Ecosystem: Abundant and diverse vegetation along the streams is crucial. Riparian vegetation provides essential food, shelter, and shade for fish and other wildlife, as well as nesting areas and wildlife travel corridors. Plants are an essential part of the food chain: streamside plants get their nutrients from the soil, and then contribute these to the stream ecosystem when leaves, twigs, and logs fall. Leaves and insects dropping from nearby trees and bushes supply food for many stream dwellers. Insects and microscopic organisms eat the plant material and algae that grows in the stream. These small creatures are eaten by fish, birds, reptiles, and amphibians, and the fish, birds, reptiles, and amphibians are eaten by larger animals, such as raccoons and eagles. Riparian habitat is used by more species of wildlife than any other habitat type.

If streamside vegetation is disturbed, replace it quickly with native species. Remember, the removal of vegetation almost always hurts rather than helps fish and wildlife. In cases of severe

flooding or erosion problems which threaten property, material may be carefully removed from the channel. When in doubt, please seek advice from trained professionals.

Vegetation used for stream bank restoration should be able to: a) withstand anticipated inundation; b) provide year-round protection; c) become well established under existing (sometimes adverse) soil conditions; d) have root, stem, and branch systems capable of resisting the erosive flows; e) withstand seasonal dry conditions; f) be collected either in seed or cutting form from nearby the project area, if unavailable from other sources.

Riparian-type plants typically found along our streams are big leaf maple, white alder, willow, cottonwood, conifers, California black walnut, elderberry, blackberry, and California wild rose. Consult with members of the local *California Native Plant Society*, the *Nevada County Resource Conservation District* or the *USDA Natural Resources Conservation Service* for assistance in determining which plants to use on your particular site and how to care for them. Check with our local *UC Master Gardeners* for native plant sources.

Unstable banks:
Streams are constantly reshaping their routes through a process of active scouring on outside curves and deposition of sediment bars on inside curves. The natural tendency for the stream course to change or meander may lead to problems on your property. Assess the condition of your stream bank and stream regularly and address problems quickly.

Unstable banks can lead to extensive bank failures that result in property loss and add large volumes of sediment to the stream system. Stream bank armoring requires specialized knowledge and should never be attempted without professional help. Actions taken to protect your bank may have unforeseen consequences downstream. For this reason, *County* ordinances require a *permit* for any work done to your stream bank or stream bed, and proper installation and maintenance of culverts. You should consult a qualified professional in planning any project affecting a stream.

You may need a *Stream Alteration Agreement* from the California *Department of Fish and Game* as well as a grading permit from the *Nevada County Department of Public Works* before you do anything to your stream bank. A *Clean Water Act, Section 404 permit from the Army Corps of Engineers* and a *401 permit from the Regional Water Quality Control Board* may also be required.

3. PREVENT EROSION AND SEDIMENTATION

Soil erosion can occur on any area on your property where soil is disturbed or not protected from the erosive forces of rainfall, storm runoff and gravity, or where vegetation is removed, such as dirt roads, driveways or parking areas, earthen drainage ditches, overgrazed pasture or corrals, exposed stream banks or patches of bare or sparsely vegetated earth. Flowing water and gravity carry eroded soil, sand, and gravel downhill; it almost always ends up as sediment in a stream. Too much sediment causes the stream to fill in, reducing the stream's ability to carry flood waters, which can increase the extent and the frequency of flooding. Sedimentation can also be very harmful to fish and wildlife - pools fill in, insects are smothered, spawning gravels are clogged, and bank erosion may increase.

Sedimentation greatly reduces habitat area and fish populations. Clean gravel, abundant aquatic insects, a variety of pools and riffles in the stream bed, plenty of places to hide, and clean, cool water are important elements of good instream fish habitat.

"Do unto those downstream as you would have those upstream do unto you." - *Wendell Berry*

Livestock with free access to a stream can quickly destroy vegetation, trample stream banks, and contaminate the water. Soil erosion from corrals and from pastures that receive heavy use may contribute harmful amounts of silt and bacteria to streams.

Erosion:
In order to control erosion, you need to reduce the force of water against the soil by directing storm drainage away from bare soil into stable, vegetated areas, or by armoring the soil with protective materials. If soil ends up in a stream, it can aggravate flood problems and wreak havoc on fish and wildlife. Keep soil where it belongs: on the ground, not in the streams!

Replant disturbed soils as quickly as possible. Spreading a thick layer of clean, grain straw on bare soil is a simple but effective erosion control measure that protects the soil from the impact of rainfall, and also reduces the force of running water by slowing it down. On ground that is not too steep, a covering of straw over bare earth will help prevent erosion until vegetation has returned. On steeper ground, straw blankets should be used to hold the soil from slipping.

Control pet and livestock access to streams and riparian corridors. Pasture or corral areas should be bound by a wide corridor of undisturbed riparian vegetation between a pasture and the stream (protected from grazing) to act as a silt-catching filter. This will help to maintain the productivity of the pasture and prevent sediment and animal waste from entering the stream system.

Fencing to create a protected riparian corridor is the best solution for the stream (check *City or County ordinances regarding set-back requirements*). To inquire about proper fence installation as well as other questions about protecting water from livestock, or for questions regarding care of farm ponds, please contact the *Nevada County Resource Conservation District* or the *USDA Natural Resources Conservation Service*.

4. PREVENT POLLUTION

Septic: Be sure you have a properly installed and maintained septic system, and pump it regularly. If you live by a stream, you have a special responsibility to make sure it is functioning efficiently. Some watersheds contain more than 100 septic systems per square mile. Because of this density, massive loads of bacteria and dissolved nutrients can enter nearby streams from poorly functioning systems, creating a health hazard for swimmers, waders, and fishers.

Solid waste, debris: For the health and safety of people, plants and animals, always dispose of wastes properly, *not* in or near the stream! Disposing of any material in or near the stream — even clippings or garden wastes — can harm streamside vegetation and cause problems both for the stream itself and your downstream neighbors if flood waters carry it away.

Hazardous materials: A few ounces of paint thinner or used oil dumped on the ground or down a drain may not seem like much, but the consequences can be far-reaching, especially when multiplied by the many households within your watershed. It is illegal to dispose of toxic materials, such as antifreeze, waste oil, paint, solvents, detergents, or other chemicals anywhere near your stream or any waterway, no matter how small or intermittent. Remember that nearly all storm sewers, and the matenals carried by them, feed into a local stream — maybe yours.

Nevada County Waste Management provides free disposal of these toxic materials at the McCourtney Road station. Call 530-274-3090 for information.

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Pesticides, herbicides, fertilizers:
Avoid application of herbicides, pesticides, or fertilizers within the streamside zone, and exercise caution when applying them on adjacent areas as well, taking care to minimize any possible wind drift. Many yard and garden chemicals are extremely toxic to aquatic organisms and inhabitants of the riparian corridors, including birds. Even small amounts of these compounds entering streams in airborne droplets as you spray or in storm runoff can affect stream life.

The *University of California Cooperative Extension/County Farm Advisor* can provide recommendations as to the type of pesticides to use. Your local *Agriculture Commissioner* can help with guidelines and *permits*. Always follow the directions on the container regarding proper use and disposal.

Livestock: Prevent animal waste from entering the stream system by controlling pet and livestock access to streams and riparian corridors.

5. STORM WATER MANAGEMENT

Traditional management of storm water focuses on collecting the rain and snowmelt that flows over impervious surfaces, such as roofs and parking lots, and piping it to local streams and rivers. Currently, about 50% of precipitation flows into waterways as storm water that damages our rivers and streams by increasing peak flows, creating erosion, and transporting pollutants. The amount of water running off our roofs, roads, and property is a major contributor to flooding during storms.

If the downspouts drain your roof directly into an underground pipe or onto some impervious surface that then drains towards the road, you can stop this runoff by simply altering your downspout to flow into your lawn or garden where the water can sink into the ground and evaporate, connect the downspout to a rain barrel to collect water for future use, or replace downspouts with drip or rain chains that descend from the gutter to the ground and slow the discharge rate of water coming from the gutter.

How to Disconnect Downspouts –
https://www.youtube.com/watch?v=4IlPiPTkgOw
http://www.portlandoregon.gov/bes/article/378192

General Stormwater Information –
http://www.sscrcd.org/pdf/Slowit.Spreadit.Sinkit.vfinal.pdf
http://www.harvestingrainwater.com/

6. CONSERVATION

Every drop of water you save, whether by creek-friendly landscaping with drought-tolerant plants, installing drip irrigation, reducing personal consumption or other strategies, directly contributes to maintaining a viable stream environment.

- **HOW TO REPORT A WATER QUALITY PROBLEM OR POLLUTION SOURCE**

  http://www.wolfcreekalliance.org/popfiles/Report-a-Problem.html

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ADDITIONAL RESOURCES, AGENCIES:

U.S. Department of Agriculture Natural Resources Conservation Service - offers voluntary programs to eligible landowners and agricultural producers to provide financial and technical assistance for the sustainable management of natural resources.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/

U.S. Army Corps of Engineers - issues permits for work done in waters under their jurisdiction. Phone: (916) 557-5100

California Department of Fish & Game - wardens and biologists can issue permits for stream bank alterations. Biologists can also provide free practical advice on making effective repairs that reduce erosion and help wildlife. Phone: 916-445-0411

Report fish and wildlife violations to *CalTIP*, Phone: 888-334-2258

Central Valley Regional Water Quality Control Board - Issues water quality certifications for all permits issued by the Army Corps of Engineers, to ensure that Corps permits meet all state water quality standards of Clean Water Act, Section 401 - Phone: 916-464-3291
http://www.swrcb.ca.gov/centralvalley/water_issues/

Grass Valley Public Works (for projects within City limits) Phone 530-274-4373 or 530-274-4350

Nevada County Code Compliance (for projects within County jurisdiction) Phone: 530-265-1222 or 530-470-2788

Grass Valley Planning Division (for projects within City limits) Phone: 530-274-4330

Nevada County Planning Dept (for projects within County jurisdiction) Phone: Phone: 530-265-1222

Nevada County Resources Conservation District – Phone: 530-272-3417

Nevada County Agriculture Commissioner - Phone: 530-273-2648

Redbud Chapter of the CNPS: http://www.redbud-cnps.org/abtchapt.htm#head

U.S. Dept of Agriculture Natural Resource Conservation Service (CA ofc) – Phone: 530-792-5600

University of California Cooperative Extension/County Farm Advisor – Phone: 530-273-4563

U.C.Master Gardeners, Nevada County – Phone: 530-273-0919, or on-line at:
http://ncmg.ucanr.org/Got_Questions/

Wolf Creek Community Allliance - http://www.wolfcreekalliance.org/

CREDIT:
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