

# Water Conservation Saves Salmon

by Joelle Geppert and Conner Everts

*Water is the gift of life. Without water, most living organisms can't survive, let alone thrive. Salmon are certainly no exception. All of the best restoration efforts are useless unless salmon have ample cool water for spawning and rearing. Most of us are aware of the need to conserve water. Whether you live in an urban or rural setting, it is likely that your water use directly impacts salmon. With growing populations, the stress on water supplies will only increase. That is why it is critical to reduce, reuse and conserve water whenever possible. There are a wide variety of ways that each of us can help to ensure there is water left in streams which include the choices we make*



*about how we garden, the appliances we use, the organizations we support, as well as the energy we choose. Here are some measures you can take to conserve water.*

## Gardening

There are many ways to reduce water consumption regardless of whether you directly pump your water from a creek or whether you turn on a city line faucet.

- **Drip Irrigation systems** provide a more efficient use of watering than overhead sprinkler systems. Drip irrigation allows you to water just the plants that need it and water is distributed throughout the soil in a manner that better services a plant's root system. There is a lot of information on the internet about drip irrigation and many nurseries can also assist. Try <http://www.irrigationtutorials.com/dripguide.htm> or do your own search! If you use an automatic timer system, make sure it has a rain setting.

- **Mulching** can significantly reduce evaporative losses, and it reduces the need to weed and lowers soil temperature, which reduces stress on plant roots. The trick with mulch is to use thick layers of organic materials, making sure it is weed free and not dry material such as wood chips.

- **Drought Tolerant Landscaping.** California is a fairly arid region, particularly in the summer months and in the southern area. It makes water sense to landscape with plants that can get by without much water. Your local nursery should be able to help

you locate plants that are suitable for your area and are drought tolerant. Look for native plants. They evolved for your region.

- **Community Gardening.** Perhaps there are others in your neighborhood or community that you could share gardening with. It might help to save water if one person grows tomatoes and another grows cucumbers.

- **Grow only what you need.** If you're like me, you may tend to plant with exuberance, thinking you're going to feed the world or can your veggies as if it's the end of the world. Think about it before you plant, do you really need 50 tomato plants?

- **Grow crops appropriate to your climate/site.** For years I tried to grow cucumbers in the same garden that I grow my tomatoes. Full sun exposure is great for tomatoes but brutal on the water needs of cucumbers. So I moved my cucumber bed to a place that gets less sun, using less water.

- **Use water retentive soil.** Adding amendments such as chicken manure or worm castings to a sandy soil can increase a soil's ability to retain water. Compost can be home-grown, bring good worms into the soil and is friable.

- **Water in the evening or at night.** Watering in the evening reduces the evaporative losses during the day. In addition, plants are more likely to utilize water during the cooler evening temperatures, so your plants get more out of the water they're given.

- **Plant perennials in the fall or winter.** If perennials are planted during the rainy season, their root systems will get larger before the hotter summer months. They'll be better established and need less watering in the summer.

- **Lawns.** Remove, replace or water only as needed. A lush green lawn certainly is comfortable on bare feet and pleasing to the eye. However, large lawns tend to use a lot of water. Several ways to reduce the water use of a lawn is to reduce the overall size, replace the grass species with a more drought tolerant species, or even let it go brown toward the end of summer (or completely). Many people tend to over-water



Photo by Thomas Tankin

their lawns. Check before you water. If you press on the lawn and it has some give and bounces back, it doesn't need to be watered yet. You may even consider removing your lawn and replacing it with drought tolerant landscaping (no mowing either)!

## Residential

Besides implementing water-smart gardening and landscaping methods, there are many ways individual households can help save water for fish.

- **Check for and fix leaks,** they add up and often are silent (check toilet leaks with dye in the tank).

- **Use ultra-low flow toilets,** shower heads, and high efficiency washing machines.

- **Don't leave the water running.** Sounds basic, but how often do you leave the water running when you brush your teeth or wash your face?

- **Cover your car** to reduce the need to wash it. Dust and other environmental pollutants may damage your car's paint job and cars do need to be washed. But please think about how often your car really needs a good washing.

- **Install a greywater system.** A significant portion of residential wastewater is only mildly "polluted" from dishwashing, hand washing, showering etc. Although not appropriate or feasible for all residential users, a greywater system could be a great way to irrigate fruit trees or ornamental plants and reuse water. There are many ways to install and use greywater systems, particularly the blancher greywater system. State guidelines for greywater systems allow for systems even in urban locations. For design considerations and use limitations please refer to: <http://oikos.com/library/greywater/branched.html>, or <http://greywater.net>

- **Installing meters** like they use in Davis can save 30% over unmetered areas. Legislation is moving forward to meter the entire

state. In addition, some areas are offering landscape meters, providing incentives to save water and money from high sewer rates. Many resources are available to commercial water users to reduce water consumption, often with significant economic incentives. Check out: <http://www.rivernetnetwork.org/>

The California Urban Water Conservation Council (CUWCC) has a library of water conservation guides, studies and a web site that includes a virtual water conservation house and a plant platelet with sustainable landscaping tips. Check out <http://www.cuwcc.org>. If you and your local utility are both members of the CUWCC, you can use this website to check out what your utility is doing to conserve water. Soon all urban utilities will be required to be members as part of the CALFED requirements.

### Rural Water Supplies



Many Californians live or are looking to live outside of urban developed areas. This often requires the development of an independent water supply that diverts water from a spring or stream. In the late summer of 2000, 2001, 2002 and 2003, portions of the upper Mattole watershed, which typically provide summer rearing habitat for juvenile coho and steelhead, had little or no above surface water due to low flow conditions combined with water extraction from rural dwellers. Based on this crisis situation, the Mattole Restoration Council (MRC), with cooperation from Sanctuary Forest and local landowners launched a water conservation program (see <http://www.mattole.org/> for more details). Even if your spring or stream does not contain fish, it is likely that it feeds a fish-bearing stream and is just as important to conserve water. Often it's especially important to protect these small stream flows as they tend to have colder water than the larger fish bearing streams and are important temperature controls.

Measures that rural water supply users can implement in addition to basic residential conservation measures include:



- *Fix leaks.* Often in rural water systems there are many locations (pipe and valve connections) that lend themselves to leaking.

Lots of small drips or leaks can add up to significant water loss.

- *Return overflow to creek or install a float valve.* This is particularly important for

those homesteaders fortunate enough to have gravity feed water. Installation of a float valve or switch can keep your tanks topped off and "excess" water in the creek. Please refer to the MRC's Water fact sheets for some simple design solutions at [http://www.mattole.org/program\\_services/factsheets.htm](http://www.mattole.org/program_services/factsheets.htm)

- *Store winter flows/rain water using large tanks.* California is a rain or shine kind of place. Storing water for domestic and agricultural use during the wet season can ensure there is water in the streams for fish in the hot, dry summer months. There are a variety of tank types and sizes available. The best way to determine the appropriate size for tanks is to calculate your water needs. There are many ways to do this. The MRC provides a simple method on their fact sheet pages (see web link above).

### Energy Production and Other Large Scale Water Uses

All over California, rivers have been dammed to create power or divert water for large-scale agricultural production and have caused serious damage to wild fisheries. This is certainly not a new development; however, the detrimental impacts to threatened and endangered fish populations have reached new critical levels. The fish kills in the Klamath River and Butte Creek and the long term degradation of native fisheries on the Eel River are only a few examples of how restriction and alteration of natural flows can be lethal to salmonids. While it may seem that the socio-economic drivers that currently appear to control the destinies of these rivers (and their fish!) seem so large, there are ways that individuals can help make a difference to ensure the rights of fish are protected. For more information and ways you can help get very needed water back into these watersheds, check out:

Klamath river fish kill: <http://www.hoopa-nsn.gov/news/fishkills.html>

Friends of Butte Creek: <http://www.buttetree.org/>

Friends of the Eel River: <http://www.eelriver.org/>

### Efforts to Purchase Water Rights

Water conservation efforts of individual households are often not enough to ensure there is enough water for salmon. Groups have begun to purchase water rights to ensure that water stays in streams and cannot be diverted for agricultural, energy or other commercial use. Two such groups

include Huey Johnson's Resource Renewal Institute Water Heritage Trust (WHT) based in San Francisco and Water Trust based in Oregon. The WHT was created to restore water to America's rivers, streams and wetlands that are vital to wildlife, natural resources, and human communities. Using a unique process of water rights acquisition, WHT acquires by gift, purchase, lease, or trade, water rights to be permanently managed for environmental protection and for recreational opportunities. WHT works in cooperation with concerned individuals, local communities, and local, state, and federal government agencies. For more information on the WHT please refer to <http://www.wri.org/projects/water.html>. The Water Trust is a similar organization that works to craft cooperative, free-market solutions. They acquire water rights through gift, lease, or purchase from willing landowners and convert them to instream water rights. <http://www.owt.org/> Consider lending financial support to these groups or starting a similar project in your watershed.

The largest single use of energy in California is pumping water from northern California over the mountains to southern California. Water conservation and energy conservation are key to reducing stress to streams and rivers. Individual action is important and basic conservation can maintain water demand levels in urban areas despite population increases. The missing link is connecting water saved to returning instream flows. The Mono Lake decision (*Fish and Game rule 5937*) mandated that water diverted for Los Angeles' drinking supply had to be replaced by conservation programs delivered by community based-organizations. On the Ventura River, efforts to restore native steelhead populations by installing a fish ladder and eventually removing Matilija Dam rely on enforcing the local water district's own water conservation plans. On the Santa Ynez River similar efforts created an excellent water conservation report, "Waste Not, Want Not," available from the Pacific available at <http://www.pacinst.org>

### Water Conservation Resources

There is a lot of information available via the internet on water conservation measures and efforts. Check out these useful sites in addition to those already mentioned in this article:

# Salmon 2100 Project

By Robert Lackey

Two dozen salmon scientists and policy experts have joined forces in an innovative project to identify ways that, if adopted, likely would restore wild salmon runs in California, Oregon, Washington, Idaho, and southern British Columbia.

The Salmon 2100 Project has been organized jointly by Oregon State University's Center for Water and Environmental Sustainability and the EPA research laboratory in Corvallis, Oregon.

The Project will synthesize and apply the best available scientific information to the challenge of protecting and restoring salmon runs in California, Oregon, Washington, Idaho, and southern British Columbia. The Project will identify and describe specific, practical policy options that, if adopted, would successfully sustain wild salmon through this century.

To identify those policy options, the Project has enlisted 24 leading Pacific Northwest scientists and policy experts, each of whom possesses stellar scientific and analytical credentials, a track record for innovative thinking about salmon and ecosystem recovery, and a demonstrated ability to think beyond the status quo. Project participants are writing chapters for a book to be published by the American Fisheries Society.

Restoring wild salmon to the Pacific Northwest is a daunting challenge. Since the discovery of gold in California in 1848, salmon runs have dramatically declined across the region due to water pollution, loss of spawning, rearing and riparian habitat, a history of over-fishing, dam construction and operation, water withdrawal for irrigation and industrial cooling, competition with hatchery-produced salmon, competition with various non-indigenous fish species, predation by marine mammals and birds, and climatic and oceanic shifts.

Many experts conclude that current salmon recovery efforts, as earnest, expensive, and socially disruptive as they currently are, do not appear likely to sustain significant wild salmon runs through 2100. It appears that other recovery strategies must be adopted if wild salmon are to survive in significant numbers through the century. Key Project results also will be disseminated to policy makers and others through a regional symposium (Corvallis, February, 2005) and an international symposium (Anchorage, September, 2005) held in conjunction with annual conferences of the American Fisheries Society.

*Project Leaders are Robert T. Lackey with the EPA, [lackey.robert@epa.gov](mailto:lackey.robert@epa.gov) and Denise H. Lach from Oregon State, [denise.lach@oregonstate.edu](mailto:denise.lach@oregonstate.edu)*



Bill Eastwood and Harry Vaughn, co-directors of the Eel River Salmon Restoration Project, releasing their last chinook salmon fry into Redwood Creek. The program, which traps and rears salmon eggs from wild stocks, was started in 1983 by local fishermen and other concerned citizens to try and restore salmon runs on the South Fork Eel River. A decision was made by DFG to not fund any of the small-scale restoration hatcheries in Region 1 for 2004-2005.

Photo By Jan Duncan-Vaughn

Water Conservation continued from page 5

Water conservation ideas for the southern California area:

<http://www.monolake.org/socalwater/wctips.htm>

Department of Water Resources:

<http://www.wdwr.water.ca.gov/>

Guide to water-wise gardening for the southern California area:

<http://www.bewaterwise.com/>

Resources of global water issues: [www.waterwatch.org.uk](http://www.waterwatch.org.uk)

PAGE 6

## Prevailing Wage Concerns

- 1. The current DIR interpretation of prevailing wage requirements leaves organizations susceptible to not being able to pay employees and liable for back wages on projects completed in the last three years.** California's agencies and legislators must address the liability assumed by grantees on work already funded by state. All solutions should include an exemption for current grants funded and contractually agreed upon by the state. There should be an amnesty clause so restoration contractors are not liable for back wages for projects that have been completed in the last three years.
- 2. Landowner participation and their financial matches are critical to many restoration projects.** How will their contribution be affected by the current interpretation? Currently, it seems landowners are able to contribute equipment and personnel at the wages and costs of their operations when they occur on their property. However, these issues are not well addressed by AB2690 and additional clarification is necessary to protect grantees and cooperating landowners.
- 3. Most restoration projects are completed on private lands and are nonpermanent.** Why are we now classifying these as "public works?" On the North Coast, approximately 70% of the land is privately owned and up to 90% of restoration projects are on private land, yet the restoration projects are often considered public works projects according to state classifications. The 2002 law lumped these projects into the "public works" classification based upon the equipment and personnel used.
- 4. Changes in prevailing wage requirements will lead to less restoration being completed in California.** This impact could cause serious ripple effects throughout the state and federal programs that currently fund watershed and fisheries restoration. If less work is completed per dollar, landowners will see less of a cost-benefit to completing restoration on their properties. Overall, people may perceive these programs that fund restoration to be too expensive for the limited results they will provide. California will be the only state requiring prevailing wage on restoration projects.

*So, if you live in a rural area with local water supplies, save water and it will go back into the river and help restore fish populations. If you're in an urban area that brings its water from faraway watersheds, save water and request that your city and water agency return that water for the environment. Finally, wherever you are, reduce your pollution imprint and increase water quality for fish and drinking.*

