CALIFORNIA: LAGUNITAS CREEK WATERSHED -- SALMON PROTECTION AND WATERSHED NETWORK

Green Gardens Help Protect Endangered Fish in the San Geronimo Creek Watershed

With a lot of hard work, local support, and creative thinking, a small grassroots community group in Marin County, California, has completed a model stormwater capture project that protects coho salmon streams, reduces bank erosion, saves water, and educates the local school children about how to protect the earth we all share. The project was completed by SPAWN, the Salmon Protection and Watershed Network (www.SpawnUSA.org), a community-based environmental non-profit in the San Geronimo Valley of Marin County, California. SPAWN's mission is to protect and restore creek and riparian habitat within the Lagunitas Creek Watershed and to protect and restore endangered coho salmon and steelhead. In 2003 SPAWN was funded through a 319(h) grant to develop citizen water-quality monitoring and nonpoint source pollution awareness outreach, and to implement an on-the-ground project to address nonpoint source pollution. This success story focuses on the rainwater catchment project completed by SPAWN in the summer of 2006.

Figure 1: Completed 30,000 gallon cistern that will serve to irrigate the Organic Garden Project using water captured from the lunch shelter roof.

Problem:

Lagunitas Creek and its tributaries, located in western Marin County (north of San Francisco), drains into Tomales Bay, an estuary of national significance. The Lagunitas Creek Watershed has been identified by State and Federal resource managers as one of the most important waterways left for wild coho salmon in Central California, and for steelhead populations as well. Coho salmon in this region are listed as "endangered" at both the State and Federal level. On average five hundred (500) spawning adult coho return yearly to the Lagunitas Creek Watershed, down ninety percent (90%) from historic levels. Factors leading to their precipitous decline include: elimination of more than half their historic spawning habitat as a result of Marin Municipal Water District dams built in

the 1900s; sedimentation of spawning habitat due to erosion from poor land-management practices and roads; impoundment of water needed for juvenile and adult salmonids; loss of floodplain and off-channel habitat as a result of development (roads, homes); and areas of poor water quality (e.g., high fecal coliform counts) likely a result of leaking septic tanks and other impacts from urbanization. Impervious surfaces from roofs, parking lots, driveways and roads also prevent water percolation into underground aquifers, causing more dangerous and frequent flooding that threatens lives and property. The increased velocity and volumes of storm water also increase soil erosion, damage creek banks and cause harmful sedimentation that harms salmon and other aquatic life. Lagunitas Creek and its tributaries have been 303(d) listed for sediments, nutrients, and pathogens, and TMDLs are scheduled for development in approximately 2008.

Project Highlights:

The goals of the 319(h) grant awarded to SPAWN, in the amount of $130,000, were: 1) to contribute to the development and implementation of TMDLs through a citizen-based water quality monitoring program, 2) to identify sources of nonpoint source pollution by surveying stream habitat, assessing potential sources, and mobilizing an "Emergency Response Team" as needed, 3) to educate the public about nonpoint source pollution, and 4) to complete a replicable, community-based restoration project designed to reduce stormwater runoff and sediment loads into creeks and to increase groundwater recharge.

Figure 2: Prototype of educational sign for rainwater capture project at Lagunitas School.

The model project, a rainwater-harvesting system, captures rainfall from the roof of a playground lunch-shelter at the local Lagunitas Elementary School in the San Geronimo Valley, collecting rainwater during the stormy winter months and diverting it into a cistern that will be used to irrigate the School's Organic Garden Project during the dry,

summer period. The first step was to repair and install a grooved, plastic roof on the school's outdoor lunch-shelter. The slanted roof leads to a rain gutter where two downspouts collect water into one pipe that flows to a new 30,000-gallon cistern near the school garden. Left un-captured, the runoff would have drained onto a concrete pad and into a 10-inch storm-drain that empties out onto an already eroded bank on Larsen Creek, a salmon-bearing creek that flows into San Geronimo Creek, one of the major tributaries to Lagunitas Creek. Excess water captured (approx. 5,000 gallons in an average rainfall year) will be diverted into a vegetated swale where it will be allowed to percolate into the groundwater table.

Project Specifications

Lunch Shelter Roof Catchment Area (square feet)	1,590
Average Annual Rainfall (inches)	36
Volume of Rainfall Harvested from Roof in cubic feet	4,769
Volume of Rainfall Harvested from Roof in gallons	35,767
Pioneer “Galaxy” Water Tank – Cistern Storage to Garden (gallons)	30,000
Amount of Runoff Diverted to a Vegetated Swale (gallons)	5,000

The project was designed cooperatively with the Lagunitas School District, with input from the Regional Water Quality Control Board staff and others. Actual implementation of the project was accomplished by SPAWN staff and volunteers and a pro-bono crew of local contractors. The project was completed in July and August 2006. Repair and installation of the roof, the pipes connecting the roof and cistern, and the cistern itself took a total of seven full days of labor shared among a 1- 8 person crew.

Figure 3: SPAWN biologist Paola Bouley (left) and crew building the water cistern at Lagunitas School, August 2006.

Results:
In an average year, the project will capture 35,000 gallons of water from the lunch-shelter roof. That water can be stored in the cistern and used during dry months to water the school's garden, where kale, snow peas, cabbage, broccoli, chard, sweet peas and other vegetables are grown for educational and school cooking projects. Excess water can be used to water a school field. Diverting the water from the roof eliminates draining into a 10-inch-diameter storm pipe that empties onto the already eroded bank of salmon-bearing Larsen Creek.

Over the next 10 years, it is estimated that 350,000 thousand gallons of stormwater runoff will be retained on site and diverted from the Larsen Creek stormdrain. SPAWN's goal is to leverage this project to encourage a heightened awareness of stormwater issues related to impervious surfaces on the School District property, and to implement further projects at both the school and other facilities. Since the project was completed in August 2006, it has already received extensive local press coverage and has garnered widespread community interest. The project is highly visible and will be used in future years as part of science school curricula (calculating rainfall, runoff from roofs and parking lots, and associated physical principles) and a watershed tour to demonstrate methods in creek care, sustainable water-use and stormwater runoff mitigation.

Figure 4: SPAWN biologist Paola Bouley at Lagunitas School project dedication, Nov. 21, 2006.

In addition, the project has forged a partnership between SPAWN and the Lagunitas School District that will allow them to move ahead with additional repairs to the campus to improve water quality, e.g., to repair unpaved roads, revegetate creek habitat and remove invasive species, and vegetate swales around key stormdrains that are the source of runoff and sediment from campus facilities.

Partners and Funding:
Partners included SPAWN, the Lagunitas School District, local contractors and community volunteers. The school project was funded by $16,000 of the $130,000 grant given to SPAWN under the 319(h) program and by a significant portion of local match for construction and planning. SPAWN secured a committed pro-bono team of

contractors and consultants on the project, who contributed $25,000 in consulting time, construction time, and materials.

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