



Salmon Protection And Watershed Network

PO Box 370 • Forest Knolls, CA 94933

Ph. 415.663.8590 • Fax 415.663.9534

www.SpawnUSA.org

Summary of Relocation of Stranded Native Fishes from Isolated Pools in the San Geronimo Creek Sub-Watershed in 2007

Prepared by Christopher Pincetich, Paola Bouley and Todd Steiner, August 2008

Summary

During the spring and summer months of 2007, a total of 931 salmonids (308 coho, 623 steelhead) in imminent danger of mortality were relocated from drying reaches on tributaries in the San Geronimo Creek Sub-Watershed to more stable creek habitat in within the Sub-Watershed. Fish were relocated from drying pools in Arroyo Creek, Larsen Creek, Montezuma Creek, North Fork of San Geronimo Creek, and Woodacre Creek. This was the ninth year of SPAWN's salmonid rescue and relocation program, which began in 1999 under permits from the National Marine Fisheries Service (NMFS) and California Department of Fish and Game (DFG). To date, a total of 17,497 salmonids have been rescued and safely relocated by SPAWN.

Introduction

Coho salmon (*Oncorhynchus kisutch*) and steelhead trout (*Oncorhynchus mykiss*) are found in the Lagunitas Creek Watershed, Marin County. California Coast coho salmon are listed as *endangered* under the State and Federal Endangered Species Act, while steelhead trout in this region are listed as *threatened* (Central California Evolutionary Significant Unit). The on average 500 coho spawners that return to this watershed annually are considered to be one of the more robust and stable populations in the state (Stillwater Sciences, 2008). However, their current abundance in this watershed is estimated to be 90% of historical population numbers.

This report is a documentation of relocation efforts for the 2007 season within the San Geronimo Valley Sub-Watershed (Figure 1). Background and information on the populations and motivation for conducting this effort are described in previous reports (Walder and Steiner, 2001). The San Geronimo Valley is the un-dammed headwaters of the Lagunitas Watershed, located in unincorporated west Marin County, California. These 9 square-miles of habitat represent less than 10% of the total 102 square-miles of the entire Lagunitas Watershed, but provides coho spawning habitat for upwards of 40% of the population¹ and upwards of one-third of coho juvenile rearing habitat (Stillwater Sciences, 2008).

¹ Not including Olema Creek Watershed

The semi-rural San Geronimo Valley has approximately 3,500 residents living on 1,500 parcels. Forty-percent of these parcels are directly within the 100-ft Stream Conservation Area, and therefore streams are already very constrained by development and riparian habitat is quite degraded. Another approximately 800- 900 parcels remain undeveloped yet face increasing development pressure. The increased value of land has resulted in new landowners who are building new, larger houses (many with multiple car garages) on open parcels, or replacing current older and more modest homes, many of which were originally built as part-time summer cabins. This change in character of the Valley threatens to significantly increase destruction of riparian habitat, increase impervious surfaces and runoff that causes bank failures, sedimentation and other associated pollution of stream systems.

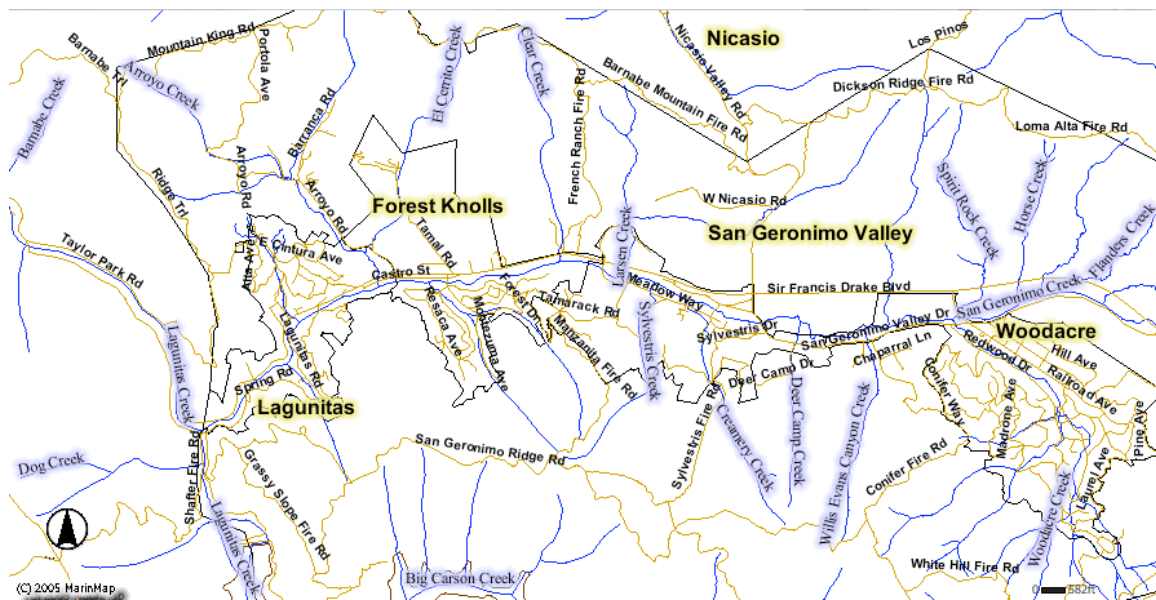


Figure 1. Map of the San Geronimo Valley sub-watershed.

Methods

San Geronimo Creek reached and tributaries were surveyed to determine presence and absence of salmonids and monitored to determine water flow, pool depth, and temperature in pools. Relocation efforts were launched when pools formed by decreasing spring and summer flows would become isolated from flow and were near drying completely. Relocation efforts were also planned based on current and previous years observations at known sites, then a survey was conducted to confirm the fish were in imminent danger of perishing. Rescue activities occurred under supervision of trained and experienced team leaders.

Fish were dip-netted out of pools and placed in insulated coolers equipped with a battery-operated aerator. Approximately every 15-45 minutes, captured fish were transported to a perennial flow section downstream on their natal tributary or to San Geronimo Creek at or downstream of the confluence where they would have passed had they not become

stranded. The exact release location was dictated by the availability of nearby pool habitat and issues of access on private property. To assure that pools where fish were relocated to were not overstocked, researchers relocated fish to several pools along stretches and made sure to release into pools where connectivity would allow fish to migrate both upstream and downstream.

Upon capture of fish, individuals were identified and lengths measured and stream conditions recorded. In some cases, measurements were done on a random sample of fish or estimates were made to group fish into size classes with 5mm increments, especially if hundreds of fish were caught at a single site. On occasion, particularly when air temperature was 32° C or higher, fish were identified but not measured in order to rapidly relocate them with minimal stress.

To further minimize disturbance and stress to fish, pools were netted for no more than 30 minutes. Netting was done by gently but swiftly sweeping a net through the water. If fish mortalities occurred, individuals were collected and frozen for delivery to NMFS. Notes were made of how each incident occurred and efforts were modified to prevent further mortalities.

Fish Rescue Results

Eight tributaries to San Geronimo Creek were surveyed for salmonids and habitat conditions between April and August 2007 (Figure 1).

A total of 931 salmonids (308 coho, 623 steelhead) in imminent danger of mortality were relocated in the San Geronimo Creek Sub-Watershed between April 16th and July 30th, 2007. Fish in need of relocation were rescued from drying pools in Arroyo Creek (26 steelhead), Larsen Creek (23 coho, 136 steelhead), Willis Evans (189 coho, 72 steelhead), Montezuma (1 steelhead) and East Fork Woodacre Creek (55 steelhead), North Fork San Geronimo (13 coho, 18 steelhead) and Roy's Pools (19 steelhead, 41 coho). The results of the salmonid rescues in 2007 are presented by tributary in Figure 2. In addition, there were 4 mortalities to steelhead fry (0.4% of the total handled) and a single signal crayfish (*Pacifastacus leniusculus*) relocated out of a drying pool from Larsen Creek.

On May 21, 2007, SPAWN biologists joined MMWD biologists to rescue a total of 41 coho salmon and 19 steelhead from Roy's Pools on San Geronimo Creek using electrofishing equipment. The upper most pool resulted in 13 coho fry and 12 juvenile steelhead and the lower pool resulted in 28 coho fry and 7 steelhead fry being rescued.

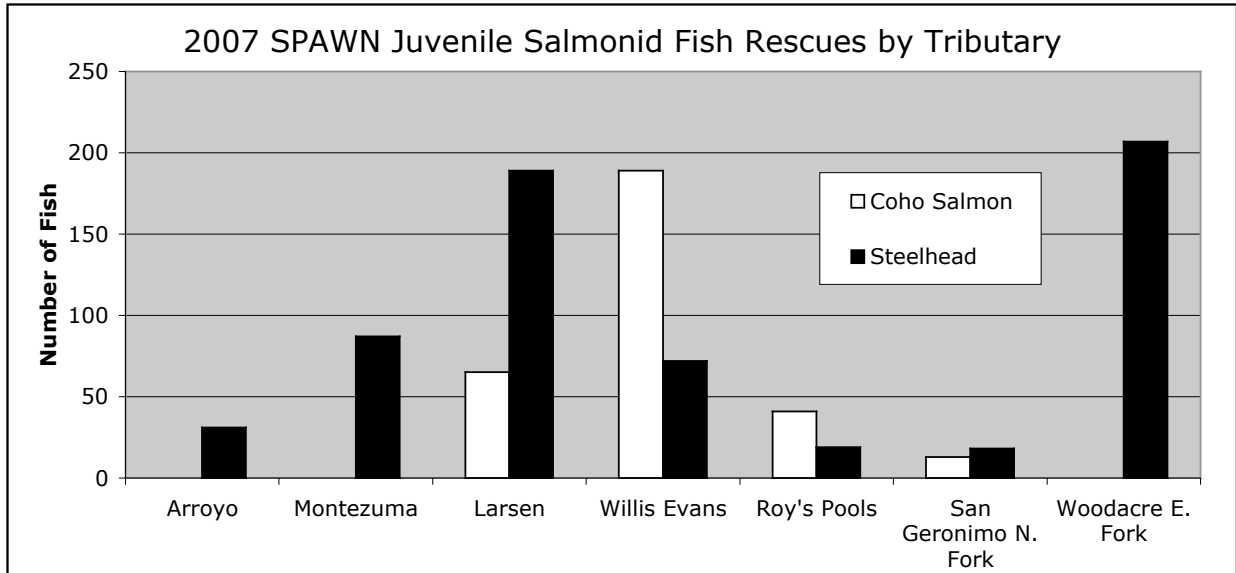


Figure 2. Juvenile salmonid fish rescue totals by tributary of the mainstem San Geronimo Creek.

Discussion

In 2007, the majority of juvenile salmonids relocated were steelhead (67% percent), and the remainder were coho (33%). In 2006, A total of 1,017 salmonids (290 coho, 727 steelhead) were rescued in the San Geronimo Creek Sub-Watershed, which was 86 more individual salmonids than were relocated than in 2007, but 18 fewer endangered coho salmon. This small decrease in total salmonids rescued and relocated may only represent a small difference in rescue efforts and is not necessarily a reflection of actual population size.

During relocation efforts, salmonids were relocated to several pools rather than depositing all individuals into one pool. This was done to minimize over-stocking pools with too many fish.

Roy's Pools is a large fish passage structure constructed in 1999, which replaced an impassable dam, with 3 large step-pools that fill and spill over copiously during high winter flows, an adjacent fish ladder which allows fish passage during low flows, and a large gravel bottom box culvert under San Geronimo Blvd. Roy's Pools had ceased flowing through the 3 large step-pools during the period of coho salmon smolt outmigration, and biologists from Stillwater Sciences were concerned that smolts had become stranded in these pools, hence the rescue effort (Frank Ligon, personal communication). The occurrence of several large steelhead smolts and dozens of coho fry trapped in these pools suggests Roy's Pools is a migration barrier for juvenile fish.

In addition, this year the County culvert below Roy's Pools that runs under San Geronimo Valley Drive ceased functioning and water was being diverted subsurface leaving the streambed dry and thereby posing a migration barrier for both juvenile and

adult salmonids. The County was notified and sediment fill was attempted to plug the hole and create surface flow. This worked during high winter flows, but has again ceased to flow under lower flow conditions. See Fig. 3.

Acknowledgements

We gratefully appreciate the dedicated assistance of many members of the community, including landowners who assisted us in gaining this valuable data. In particular we want to thank our volunteer Team Leaders and Valley residents Mel Wright, David Ford, Megan Isadore, Al Pisciotta, Julie and Noahlani Litwin, as well as Natalie Galatzer and Heidi Lackis (SPAWN's WSP/Americorp Interns) for helping to survey streams, ensure safe handling of all fish and accurate recording of field data.

References

Stillwater Sciences, 2008. Lagunitas Limiting Factors Analysis - Limiting Factors for Coho Salmon and Steelhead Prepared by Stillwater Sciences, 2855 Telegraph Avenue, Suite 400, Berkeley, CA 94705.

Walder, R, and Steiner, T. 2001. Relocation of Stranded Native Fishes from Isolated Pools in the San Geronimo Creek System. Salmon Protection and Watershed Network (SPAWN), Forrest Knolls, CA 94933.