Volume One

January 14, 2009

Project Update: Fish relocation & creek flow diversion

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STEVENS CREEK RESTORATION PARK PROJECT

OFFICE OF THE DIRECTOR OF PUBLIC WORKS

Stevens Creek Corridor Creek Restoration Project

On May 20, 2008, the City Council awarded a contract for construction of Stevens Creek Corridor Phase 1A, Creek Restoration, to Ferma Corporation. This phase of the project included significant restoration work in the creek channel and creation of a new alignment for part of the creek within Blackberry Farm. The native fish had to be removed from the portion of the creek within Blackberry Farm and the creek channel dewatered before the restoration work could proceed. Below is a recap of the flow diversion work and fish relocation effort.

"Our creek is quite pristine from the standpoint of percentage of native fish."

Fish Relocation Summary

Before channel restoration work could commence, fish in the creek had to be captured and relocated. Our stretch of Stevens Creek is home to federally-threatened Central California Coast steelhead and three other native fish species: Sacramento sucker, California roach, and three-spine stickleback. Steelhead have a special degree of legal protection. They had to be caught and transported in accordance with permit conditions and scientific protocols. We also committed to rescue and relocate all native fishes as part of this project.

A preliminary day of fish "salvage", i.e. capture and relocation, occurred on June 30. That day, a fish salvage crew cleared short segments of stream to allow installation of upstream and downstream coffer dams and diversion piping, at the upstream and downstream ends of the creek restoration work (near Blackberry Farm limits). Once these areas were cleared of fish, coffer dams and a fish screen dam were installed as well as nets. These items kept new fish from entering the construction zone and allowed the fish within the designated zone to be captured and relocated.

The fish salvage effort continued July 7-11 and was led by our project partner, Santa Clara Valley Water District. The work was done by a group of 20 biologists and wildlife specialists broken into three teams that worked concurrently. Specialized knowledge and experience were required to conduct this effort in accordance with regulations and permit requirements. This type of activity is fairly rare, as are biologists with the appropriate qualifications and experience.

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Fish relocation was able to begin after coffer dams and nets were installed to cordon off the creek channel. The coffer dam and nets are visible in the background of this photo

Fish were captured and relocated from all areas of the stream, including shallow riffles as well as pools. Despite the shallower water, it was more difficult to spot fish in the riffles than the deep pools, and fish were just as abundant in the riffles as the pools

In the deeper pools the biologists wore chest waders to access all fish habitat areas. Most pools were re-fished each day, so as not to leave any fish behind

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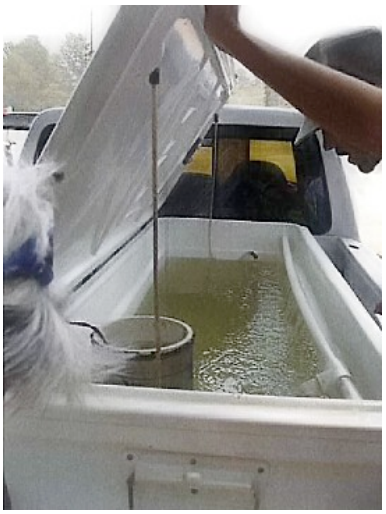
Insulated transportation tanks with water recirculation systems were used to transport fish to 9 new upstream and downstream release locations

Our biologist group was assembled from throughout Northern California, in order to provide the level of experience required to conduct the "fish rescue" work successfully.

The three biologist teams captured fish, placed them with nets into in-stream 'baskets', then moved the fish to transport trucks with special transportation tanks. At the transportation tanks, the fish were sorted and counted, then delivered to previously-approved locations upstream and downstream where they were carefully released.

The steelhead were roughly categorized by age. They appeared to be over 93% "young of the year", 5% 1+ year old, and 1% 2+ year old. Only one larger steelhead/rainbow trout was found.



The other species displayed a wider age range: 14%, 60% and 14% adults for sucker, roach and stickleback respectively. During the entire salvage operation, only 2 nonnative fish were found, one carp and one goldfish. The absence of undesirable, nonnative fish species was deemed an excellent finding by the biologists. Our creek is quite pristine from the standpoint of percentage of native fish.

The creek dewatering was completed after the fish rescue operation was finished. Biologists reviewed the creek thereafter and confirmed that steelhead had been properly relocated per the applicable protocols. They concluded that the steelhead salvage effort was implemented successfully.

Vegetated areas were examined carefully. Fish were found and rescued throughout the week as creek sections received multiple passes by the biologists

STEVENS CREEK CORRIDOR UPDATE

Fish were first caught in dip nets

The fish were temporarily held in floating, in-stream containers, called 'live-cars', that allowed creek waters to flow through

The fish were transferred from the live cars to buckets containing cool creek water, then swiftly hand-carried to transportation tanks for delivery to designated release locations by biologists

STEVENS CREEK CORRIDOR UPDATE

Flow Diversion Summary

Work in the creek channel was allowed to commence in mid June in accordance with permit conditions. The contractor was responsible for developing an appropriate plan to divert creek flows and allow construction of the channel restoration. The City, in collaboration with the Santa Clara Valley Water District, was responsible for relocating steelhead and other native fish from the portion of the channel to be dewatered. About 2,250 feet of the channel needed to be dewatered.

Fish that were transported and released	
Steelhead / Rainbow Trout	**1,405**
Three-Spine Stickleback	**1,365**
Sacramento Sucker	**1,014**
California Roach	**858**
Total Fish Rescued and Relocated	**4,642**

Temperature rise of creek water within the diversion system was tightly capped by project permits. Water temperature within the diversion system had remain similar to that within the creek itself. Most conventional diversion systems do not regulate water temperature. However, significant temperature rise would be detrimental to steelhead and other wildlife downstream of the outfall.

The contractor developed and successfully implemented the plan for creek flow diversion. The plan involved upstream and downstream coffer dams, a specialized pumping system, burying of the diversion pipeline to control temperature rise, and an outfall structure to dissipate energy and prevent scour. The section of the diversion pipeline within the parking lot was buried below ground. Another portion was "buried" above ground instead, to avoid disturbance to tree roots, provide pumping efficiency and/or clearance from utilities and underground features. The system was approved, installed and tested prior to launching the creek dewatering.

The diversion system was in effect from July to October, and it performed exceedingly well. The contractor and the city both monitored the system's performance daily and both concluded that it is met or exceeded the goals. Temperature rise was well within permit standards, and was typically similar to the naturally-occurring temperatures in the creek. Even during very hot weather in July and August, when water temperatures can spike, the desired temperature differentials were maintained. Flows at the outfall remained cool, clean and clear throughout the duration of the flow diversion.

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Each fish was identified and logged. Some adult fish were found but overall the steelhead were primarily no more than 1 year old

Downstream of the diversion, creek conditions were maintained and protected as intended. Water temperature and quality were protected, and conditions for the fish and wildlife remained excellent.

The diversion system was decommissioned and removed in late October. At the upstream and downstream coffer dam locations, where structures impinged on the channel, the removal was performed with great care. At those sites, it is now difficult to discern where the dams had been placed. Those locations appear nearly identical to the pre-project condition and now look undisturbed, which was our intent. Staff and the project team are pleased with the overall flow diversion process and found that the project goals for this element were well achieved.

A young steelhead was briefly handled by one of the biologists after being captured in a dip net

In the vicinity of tree roots and overhangs with more places for the fish to hide, the biologist team worked slowly and with great care to find the fish under cover