

15572
BibKey
606A

BIG LAGOON/REDWOOD CREEK FISHERIES INVESTIGATION
PROGRESS REPORT

30 June 1993

Dr. Jerry J. Smith
Department of Biological Sciences
San Jose State University

METHODS

Water temperature and dissolved oxygen profiles were taken at sites in Redwood Creek lagoon and in the deep series of pools upstream of the delta above the lagoon on 4, 9 and 24 June. Salinity profiles were also taken in the lagoon on all 3 dates. Nutrient (nitrogen and phosphate) inflows from Redwood Creek and Green Gulch to the system were also determined; nutrient sampling on the 4th occurred at the start of and during a thunderstorm.

Fish populations in the lagoon were sampled by seining on 4 June. Fish populations in the pools upstream of the delta were sampled by backpack electroshocker on 9 June and seine on 4 June.

Fish populations and stream habitat conditions were sampled in Redwood Creek at 3 sites upstream of the beach area. Sampling above and below the first bridge was done on 9 June. Sampling at a site (Eucalyptus Grove) downstream of the town water supply diversion and at Muir Woods National Monument, near the parking lot, was done on 24 June.

Fish populations at each of the sites will be resampled 1-2 times this summer, and 1 additional upstream site will be sampled. Water quality conditions in the lagoon and in the pools upstream of the delta will be sampled at least 3 times this summer.

SUMMARY OF RESULTS

Lagoon

On 4 June the lagoon was saline and the sand bar had begun to develop. Runoff from the storm on that day lowered the channel through the bar, and on the later two dates the lagoon was shallow and fresh. On 4 June juvenile steelhead and coho were common in the lagoon, and had demonstrated good growth. Coho were not collected in late summer 1992, possibly due to high summer water temperatures. The fate of steelhead and coho in the lagoon will be followed by sampling at least twice more this summer.

Also collected on 4 June were threespine stickleback and staghorn sculpin. Striped bass, which were common in late summer 1992, were not (yet?) present.

Pools Upstream of the Lagoon

Water temperatures were cool on all three sampling days, but on 24 June bottom dissolved oxygen levels were depressed at some of the stations. Near the footbridge high turbidities and low bottom dissolved oxygen levels were due to wading and splashing by dogs.

On 9 June the pools were sampled by electroshocking along the edges (much of the habitat was too deep to electroshock) and on 4 June by seining near the backwater channel. Coho were abundant and showed good growth. Also collected were steelhead, threespine stickleback, prickly sculpin, and a single Sacramento Perch. The perch had apparently washed down from a pond at the Zen Center.

Stream Stations

High storm flows in January and February did not alter channel conditions at the three sampled sites. Individual pool, glide, run, and riffle habitats had changed relatively little in location, size, depth, or substrate conditions.

Coho were less abundant than in 1992, but steelhead were much more abundant. Coho were larger than the steelhead, reflecting their earlier spawning and hatching. The high flows present on 9 and 24 June also resulted in sharp differences in habitat use between the two species; coho were primarily in pools, while steelhead were in all habitats. As flows decline habitat use may change, since coho are less tolerant of current, but are more aggressive. Other fish species, such as sculpins and threespine stickleback showed distributions and abundances similar to 1992. The only amphibians encountered were Pacific giant salamander larvae at Muir Woods.

Nutrients

In summer 1992 and on 4 June prior to rain nitrogen was scarce or absent in the pools upstream of the lagoon, but algae and floating aquatic plants were abundant; this nutrient, rather than phosphate, is usually the limiting nutrient for algal growth at the site. The rain on 4 June resulted in inflow of nitrates from both Green Gulch stream channels and from Redwood Creek. On 9 and 24 June nitrate was present in excess of plant needs in the pools. On the 9th inflow of nitrate from Redwood Creek was low, but nitrate was more abundant in the very slight inflow from Green Gulch. On the 24th no nitrate was present in the slight inflow from Green Gulch, but nitrate levels were significant (1.8 mg/l N) in Redwood Creek. No nitrate was detected in Redwood Creek 0.6 miles upstream of the beach on 24 June.

Algae and higher plant growth in the lagoon and the pools immediately upstream of the lagoon is sustained by episodic inflows of nitrogen from multiple sources. Tracking of nutrient levels and algal abundance in the pools and inflow waters will continue through the summer.