Draft summary of San Leandro Creek habitat assessment

Introduction

San Leandro Creek is comprised of a 28,000 acre watershed located in Alameda and Contra Costa counties (Figure 1). The upper watershed is mostly undeveloped and closed to recreation except for some hiking trails. The main development is associated with the City of Moraga. San Leandro Creek flows through Upper San Leandro and Chabot reservoirs (East Bay Municipal Utilities District) before reaching the City of San Leandro and eventually San Francisco Bay.

A variety of methods are available to rank the habitat value of creeks as they relate to fish species or populations (Overton et al 1997, Bisson et al 1982, Cowardin et al 1979). Key parameters involved in most habitat classification schemes include substrate size and type, gradients, stream velocities, and cover types. Increasing the precision of data collected regarding habitat parameters allows for more accurate predictors of habitat value for specific species. In order to describe the existing aquatic habitat in San Leandro Creek from Chabot Dam to Highway 580, we conducted a habitat assessment on January 10-11, 2000.

Methods

The 1.1 mile section of San Leandro Creek from Chabot Dam to Highway 580 was surveyed over a two-day period. The approximate release from Chabot Dam during this period was 80 gallons per minute. Habitats were classified into run, riffle, run or pool units based on literature descriptions and surveyor experience (Overton et al 1997 and Bisson et al 1982)(Table 1). Gradient descriptions from Phil.

Table 1. Habitat Unit Descriptions.

Riffle	Relative high gradient with substrate of large gravel or cobble; above average water velocities; below average depths; surface turbulence.
Run	Moderate gradient with substrate of small cobble and/or gravel; above average water velocities; below average depths; low to moderate turbulence.
Glide	Low gradient with substrate of small gravel or sand/silt; below average velocities; average depths; no turbulence.
Pool	Low gradient with substrate of fine material; below average water velocities; above average depth; no turbulence.

For each habitat unit average depth, width and total length was measured or calculated. In addition, information was collected on cover type including canopy, overhanging vegetation, undercut bank, boulder and woody debris. Stream velocities and pebble counts were recorded at selected habitat units. Observations on log-jams and fish species observed were also recorded.

Results

One hundred seventeen habitat units were mapped comprising 5,755 feet of creek. Overall the surveyed portion had significant amounts of cover in the form of canopy, woody debris and overhanging vegetation. All of the habitat units contained a minimum of 1 cover type, with most containing 2 to 3 cover types. Based on parameters observed (gradient, substrate, geographic landmarks) the area surveyed was partitioned into three reaches 1-3 (Table 2).

Table 2. Reach descriptions for surveyed creek segment.

Reach	Boundaries	Length (feet)
1	Chabot Dam to Bridge (Park Entrance)	2,386
2	Bridge (Park Entrance) to Weir Structure	1,908
3	Weir Structure to Highway 580	1,461

Reach 1 is located within the park and runs through a predominantly non-native eucalyptus woodland community. There is a considerable amount of woody debris within the channel and there are two major debris jams. The substrate within riffles is composed of highly angular crushed rock in the large gravel to cobble size range. Substrate within the glides and pools is comprised of predominately silt and sand. Average width in Reach 1 was 12.2ft, while average depth was 1.4ft. Figure 2 depicts the substrate profile for a riffle within Reach 1. There was a substantial amount of aquatic macrophytes and leaves covering much of the substrate within Reach 1. Velocities in riffle and run habitats ranged from 0.1 to 0.5 ft/sec.

Reach 2 runs from the western portion of the park through a residential area ending at a weir structure. As with Reach 1 there is significant amount of covers throughout the reach. Large woody debris (LWD) is not as abundant in Reach 2 as in Reach 1. Within this reach the average width is 12.0 ft, while the average depth is 1.1ft. Pools within Reach 2 are quite long with long lead-ins and tail-outs. The gravel substrate, while containing some angular crushed rock, is composed of small to medium gravel and bedrock (Figure 3). The bedrock results in the creation of some cascade pool and riffle habitat. Velocities within this reach were below 0.3ft/sec.

Reach 3 runs from the weir structure to Highway 580. The surrounding land is comprised of residential units in which the creek flows through backyards. Average width for the reach is 12.9ft and average depths are 1.4ft. The majority of this reach is composed of glides and pools with some riffle habitat. Gravels are generally small to pea size (7/8" to 5/16"). Stream velocities were less than 0.3ft/sec. There were at least ten separate water diversions in this reach. Most of the diversions were simply pumps with inlet hoses placed in the creek. However, one of the diversions involved a small dam that was used to form a side channel that fed a pump. While there was still canopy cover within this reach, LWD was lacking and there was less natural vegetation along the banks.

During the habitat survey we observed largemouth bass (*Micropterus salmoides*) and common carp (*Cyprinus carpio*). Generally the character of the channel is typical of

flood control structures with low sinuosity (little meander) and a trapezoidal profile. From Highway 580 the creek flows through the cities of Oakland and San Leandro before reaching San Leandro Bay. This reach is typical of an urban creek/floodway with the lower portion flowing through an industrialized area.

Discussion

District staff have conducted two fish surveys on San Leandro Creek below Chabot Dam. The first survey was conducted on 7/16/95. Species found during this survey include three-spine stickleback (*Gasterosteus aculestus*), Sacramento sucker (*Catostomus occidentalis*) and prickly sculpin (*Cottus asper*). No salmonid species were observed. This survey was related to a District project and the purpose was not to capture salmonids.
The second survey, conducted in 1997, was actually a fish rescue operation coordinated by Pete Alexander from East Bay Regional Park District. Bert Mulchaey accompanied him to the stretch of San Leandro Creek below Chabot Dam in an effort to rescue some trout that had gone over the spillway from Chabot. While rescuing fish, they collected several fish that had the appearance of steelhead rather than hatchery trout. Pete took genetic samples from six fish captured that day. Most of these fish were collected below the bridge at the entrance to Chabot Park.

Additional Work

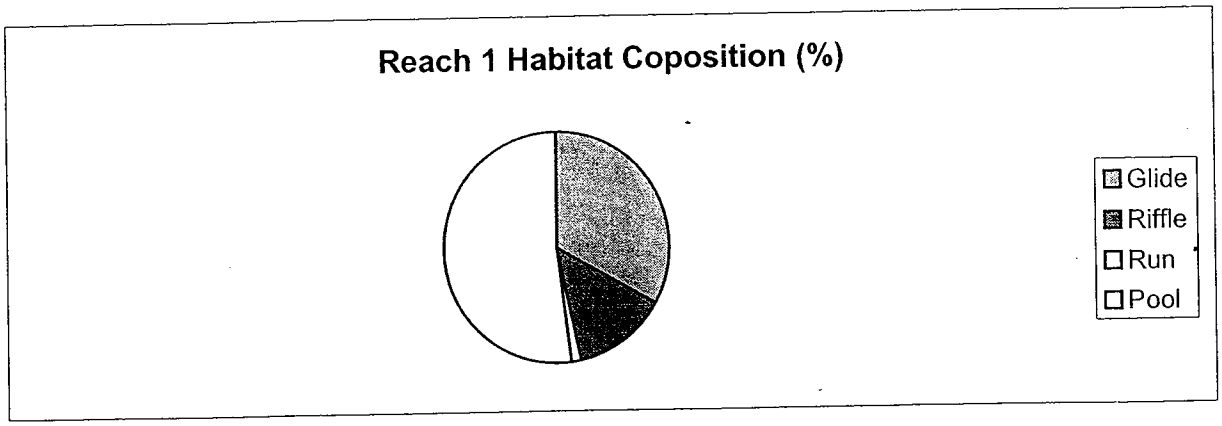
Based on the area surveyed fish community sampling sites were selected. These sites will be surveyed using backpack electrofisher units on a seasonal basis. These surveys will provide a complete picture of the fish community structure of the creek over the period of a year. A temperature datalogger was installed in Reach 1 to record the annual temperature regime of the creek.

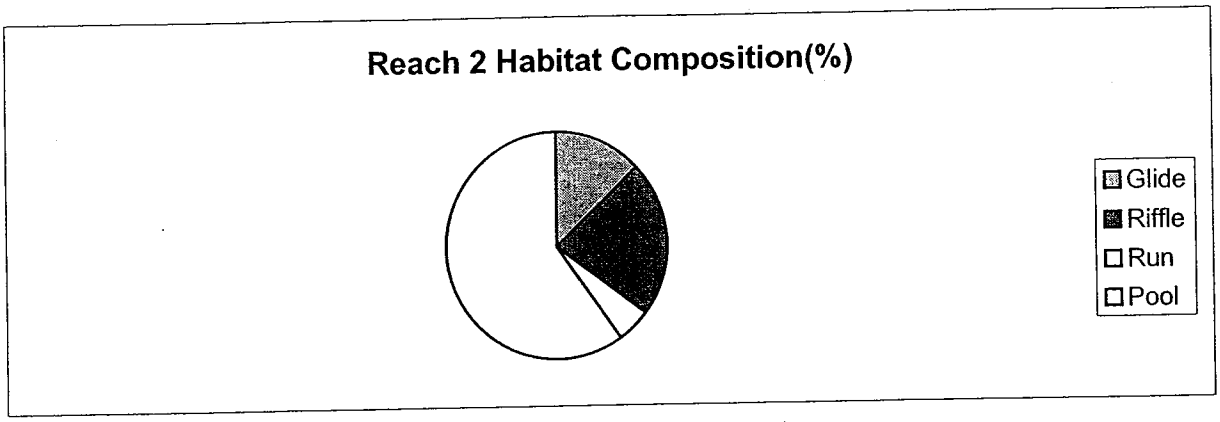
Literature Citations

Bisson, P.J., J.L. Nielsen, R.A. Palmason, and L.E. Grove. 1982. A system of naming habitat types in small streams, with examples of habitat utilization by salmonids during low streamflow. Pages 62-73 *in* N.B. Armantrout, editor, Acquisition and utilization of aquatic habitat inventory information. American Fisheries society, Western Division, Bethesda, Maryland.

Cowardin, L.M., V. Carter, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. USFWS. Wasshington D.C.

Overton, C.K., S.P. Wollrab, B.C. Roberts, and M.A.Radko. 1997. R1/R4 (Northern/Intermountain Regions) Fish and Fish Habitat Standard Inventory Procedures Handbook. Gen. Tech. Rep. INT-GTR-346. Odgen, UT: USDA, Forest service, Intermountain Research Station. 73p.





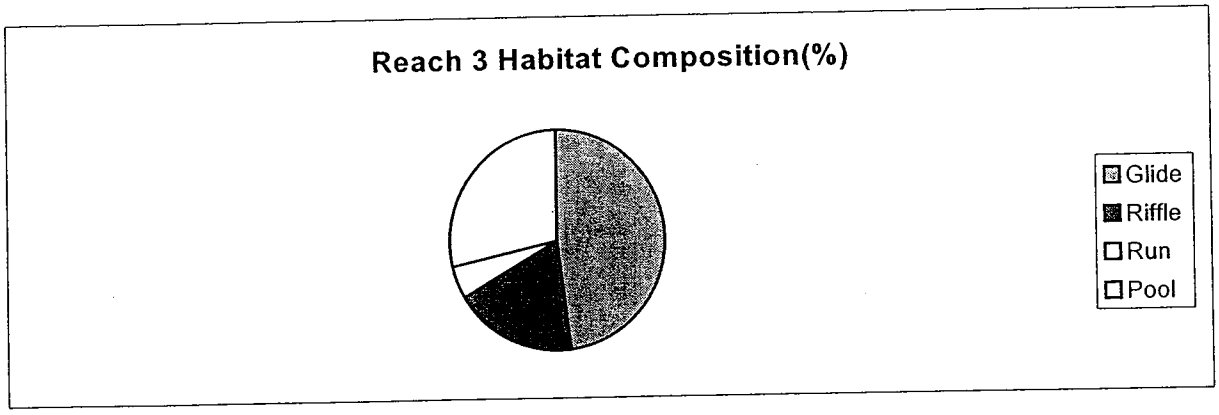


Figure X. Habitat units per reach as percentage of reach, San Leandro Creek 2000.

Fig. 1. Reach 1 Substrate Profile

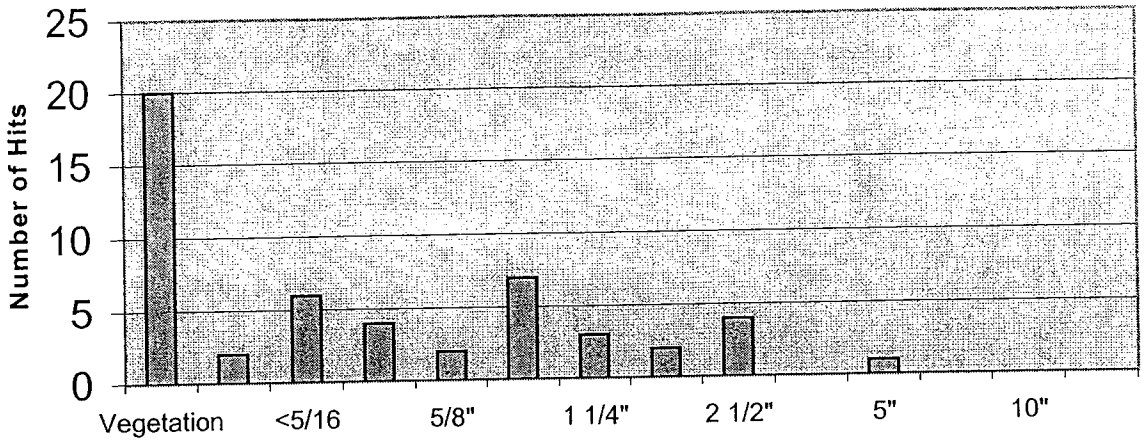


Fig. 2. Reach 2 Substrate Profile