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## TECHNICAL MEMORANDUM

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**TO:** Chris Berry  
City of Santa Cruz Water Department

**FROM:** Jeff Hagar  
HAGAR ENVIRONMENTAL SCIENCE

**DATE:** January 5, 2009

**PROJECT:** City of Santa Cruz Habitat Conservation Plan, Lagoon Fish Population Sampling

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Fish population and steelhead rearing were assessed in Laguna Creek lagoon and the San Lorenzo River lagoon during the summer of 2008. Surveys were conducted in the early summer and again in the fall using large seines. In Laguna Creek a 100 foot long by 6 foot deep seine with a bag and ¼ inch mesh was used. In the San Lorenzo River lagoon we used a 150 foot long by 8 foot deep seine with ¼ inch mesh. A small 15 foot long by 4 foot deep seine with 1/8 inch mesh was used in both lagoons to sample for gobies. A summary of the results of the survey follows.

### Laguna Creek

#### Spring (June 5)

- Lagoon closed
- Steelhead catch included a couple of young-of-year in the 40-50 mm fork length (FL) size class, larger juveniles likely including both 1+ and 2+, and 2 adults.

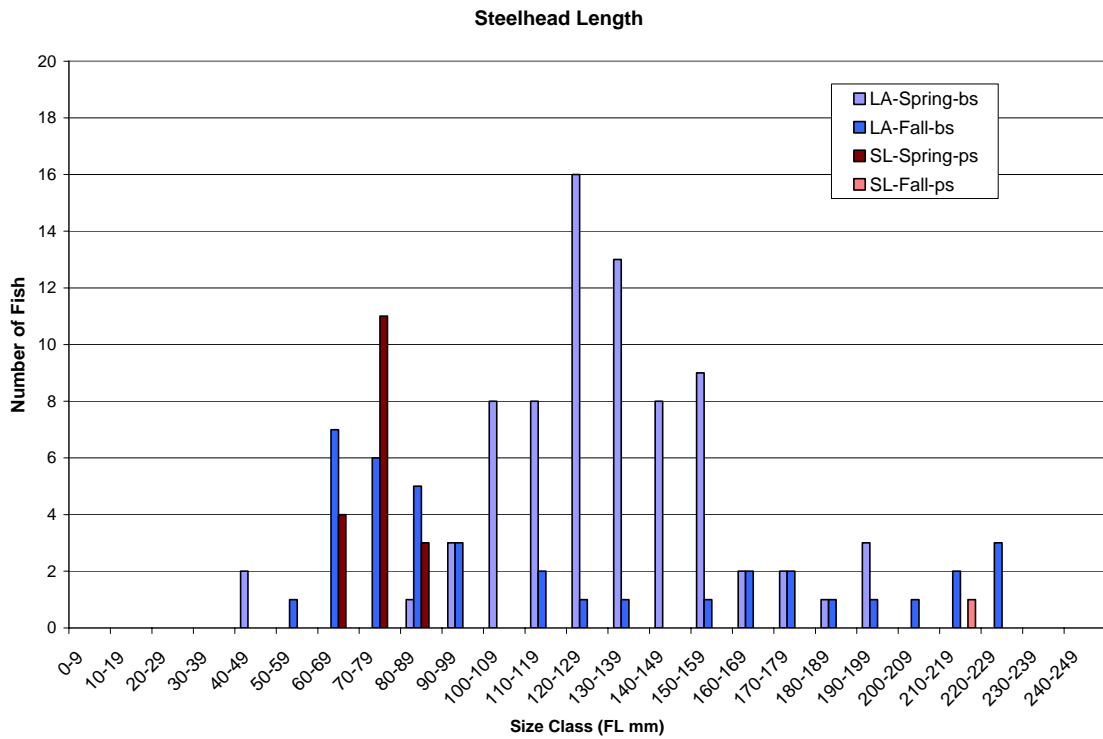
Species	LA-1	Just u/s LA-1	Neck	Above neck	LA-1.5 (goby seine)	LA-2	LA-3	Grand Total
# Hauls	1	1	1	1	1	1	1	6/1
Steelhead	1	1	2	52		22		78
Staghorn sculpin	1	7	3	5	1			17
Starry flounder	2			5	1	1		9
Tidewater goby		1			5			6
Prickly sculpin					1	1		2
Grand Total	4	9	5	62	8	24	0	112

Note: See Figures for sample site locations; U/S = upstream, D/S = downstream

Fall (September 30)

- Lagoon closed
- Steelhead catch included:
  - fish in the 50-100 mm FL size range typical of young-of-year in the fall that may have moved into the lagoon relatively recently;
  - larger juveniles that may have included young-of-year that reared in the lagoon since spring or early summer as well as 1+ or 2+ fish that could have been in the lagoon all summer or entered at any time.

Species	LA-1	Just U/S LA-1	Neck	Above neck	Pond confluence to beach	Pond confl. U/S to camp	Camp to dam	Grand Total
# Hauls	1	1	2	1	1 long	1 long	1 long	8
Steelhead	1			21	15		3	40
Stickleback		7	2	7		6		22
Staghorn sculpin				1				1
Starry flounder							1	1
Grand Total	1	7	2	29	15	6	4	64



## San Lorenzo River

Spring (June 6, June 19)

- Lagoon open
- Steelhead found only at station just upstream of trestle.
- Steelhead catch included juveniles in the 60-90 mm FL size classes typical of relatively small stream reared 1+ fish at this time of year or very fast growing yoy that may have already spent some time in the lagoon.

Species	D/S of trestle	Just U/S of trestle	Between trestle and WQ site	U/S edge of Riverside	Bend U/S of riverside	Soquel bridge	Grand Total
# Hauls	1	1	1	2	1	1	7
Staghorn sculpin		107	44	57	54	5	267
Starry flounder	13	23	1	1	3		41
Arrow goby				31	2		33
Steelhead		18					18
Topsmelt	2			9			11
Sacramento sucker				6			6
Shrimp	6						6
Prickly sculpin			2	2		1	5
Stickleback		1			2		3
Pipefish		1			1		2
Tidewater goby					1		1
Grand Total	21	150	47	106	63	6	393

Fall (October 7-8)

- Lagoon closed/open, breached the night of Oct. 7.
- Catch likely influenced by lagoon level. High lagoon on Oct 7 limited effectiveness of seine in deeper water and at finish due to lack of beach. Seining more effective on Oct 8 at lower lagoon level after breach.
- Topsmelt very abundant at lower stations before breach, not captured anywhere after breach.
- Steelhead catch included a single large smolt-sized fish before breach, nothing after.

Before Breach

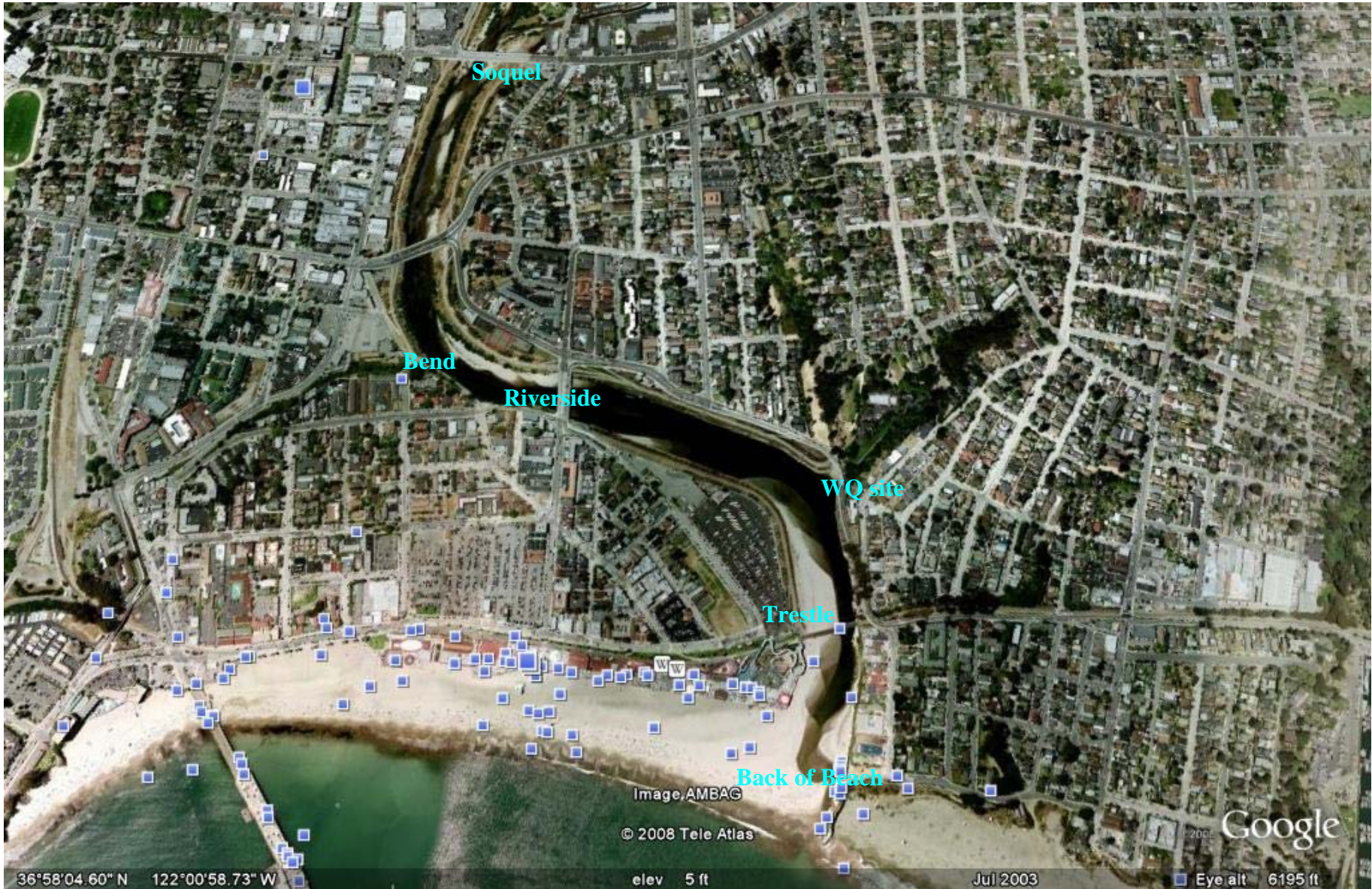
Species	Back of beach	Just U/S of trestle	U/S of trestle	Between trestle and WQ site	Grand Total
# Hauls	1	1	1	1	4
Topsmelt	80	500	90	29	699
Stickleback			6		6
Pipefish				1	1
Staghorn sculpin	1				1
Steelhead		1			1
Grand Total	81	501	96	30	708

After Breach

Species	D/S of trestle	U/S edge of Riverside	Bend U/S of Riverside	Soquel bridge	Grand Total
# Hauls	2	1	1	1	5
Pipefish	2	18			20
Stickleback	3	14		2	19
Shiner surfperch		14			14
Prickly sculpin		7		6	13
Goby				10	10
Pacific herring		3			3
Anchovy		3			3
Crab		2			2
Shrimp		1			1
Staghorn sculpin		1			1
Grand Total	5	63	0	18	86



Laguna Creek Lagoon sampling sites.



San Lorenzo River lagoon sampling sites.