

Comparing Demographics of Two Steelhead Populations and Habitat Characteristics



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CAL POLY

Oncorhynchus mykiss irideus



Coastal rainbow trout

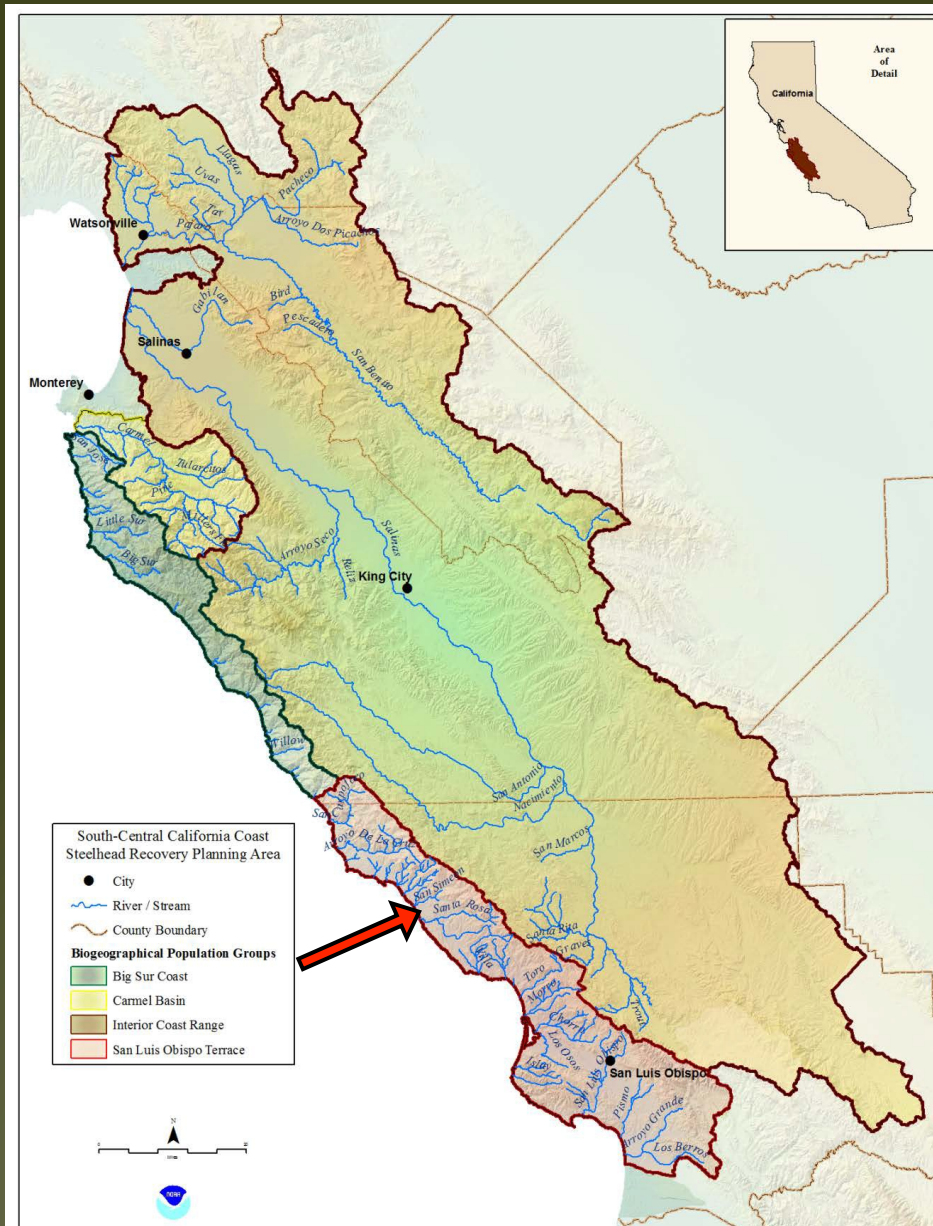


Steelhead

Life History



Threatened Species



- Listing reaffirmed in 2006
- ESU delineation:
South-Central California Coast

Seasonal Changes

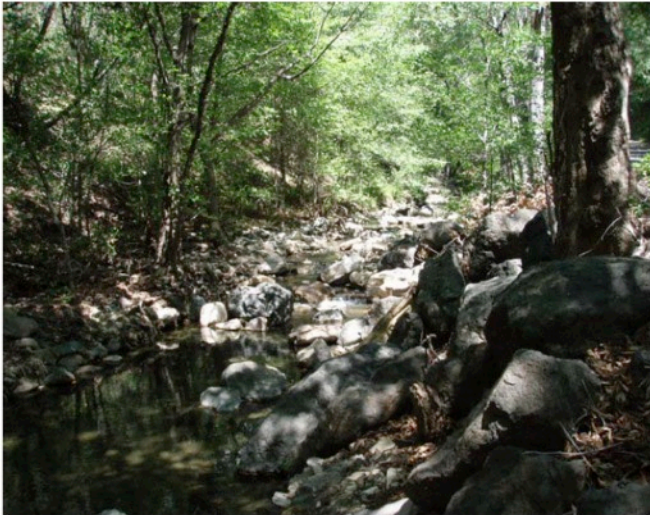


Seasonal Changes



Purpose of Study

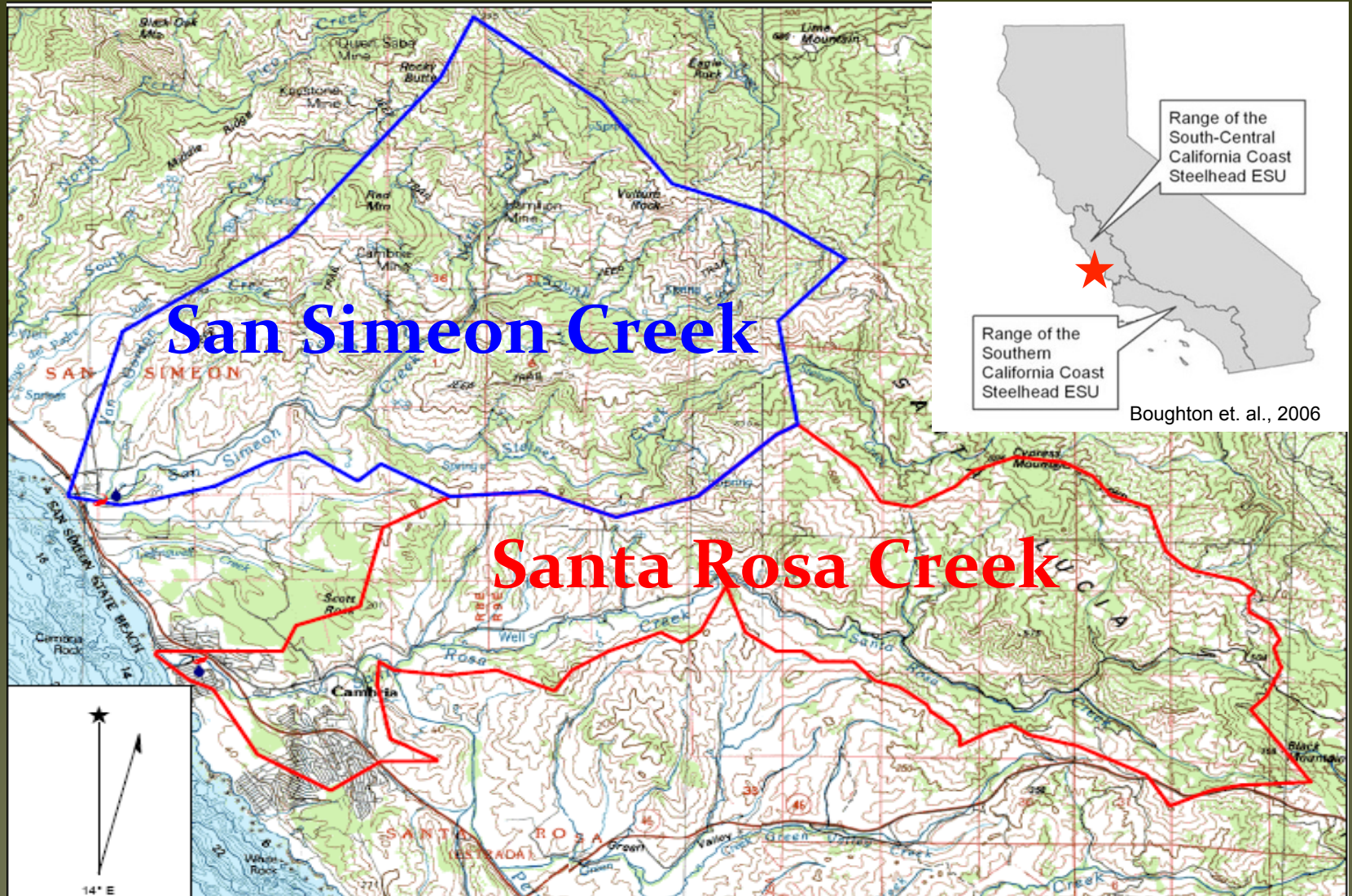
SANTA ROSA CREEK STEELHEAD HABITAT AND POPULATION SURVEY



Prepared by:
Jennifer Nelson, DFG
Assisted by:
Eileen Baglivio and Tim Kahles,
CA Conservation Corps
2005

- Examine habitat data collected by CA DFG in 1993 and 2005
- Develop baseline demographic data for steelhead trout
- Compare demographic and habitat data between two watersheds

Watersheds



San Simeon Creek



Lower watershed, San Simeon Creek

- 10.8 km (mainstem)
- Third order stream
- Watershed: 83 km²
- Various land uses



San Simeon Creek lagoon

Santa Rosa Creek



Lower watershed, Santa Rosa Creek

- 24.1 km (mainstem)
- Third order stream
- Watershed: 121.7km²
- 90% privately owned



Santa Rosa Creek lagoon

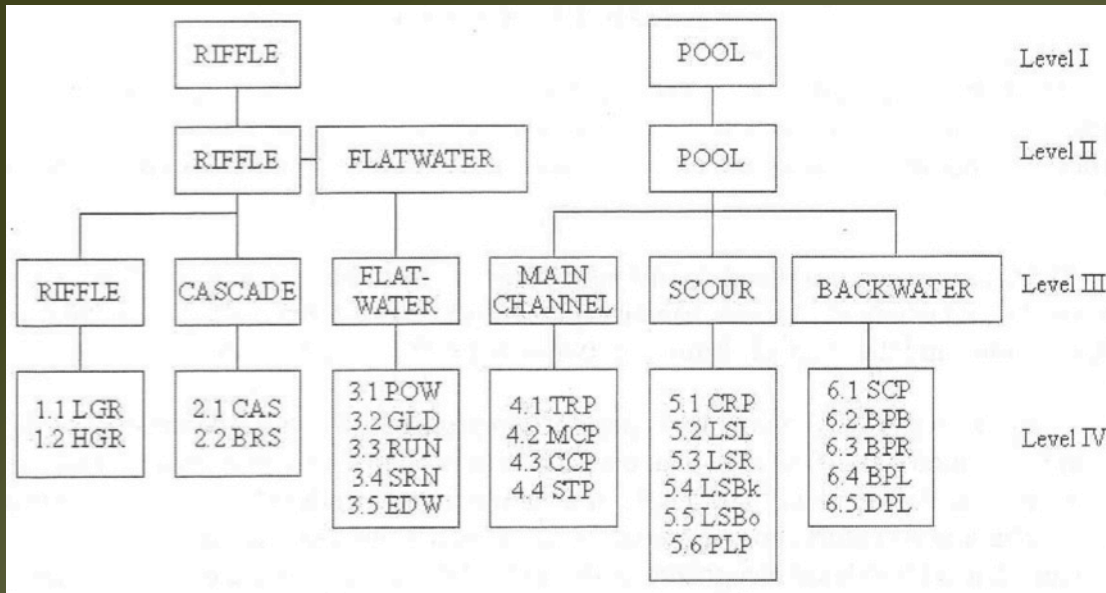
Environmental Conditions



- Water Temperature
- Stream Flow

Habitat Surveys

California Salmonid Stream Habitat Restoration Manual



Flosi et al, 1998

- Flatwater, Riffles, Pools

- Abbreviations:

LGR = Low Gradient Riffle

Habitat Surveys



Santa Rosa Creek, summer flow

- San Simeon Creek
 - Aug. 15 – 25, 1993
Steiner Creek (5.6km) to limit
 - Aug. 18 – 25, 2005



San Simeon Creek, anadromous limit

- Santa Rosa Creek
 - July 13 – Oct. 22, 1993
 - Sept. 7 – Oct. 3, 2005

Outmigrant Traps

San Simeon Creek, 2005



- March 14-22, April 14-June 8, 2005
- Located 0.56 km upstream

Santa Rosa Creek, 2005



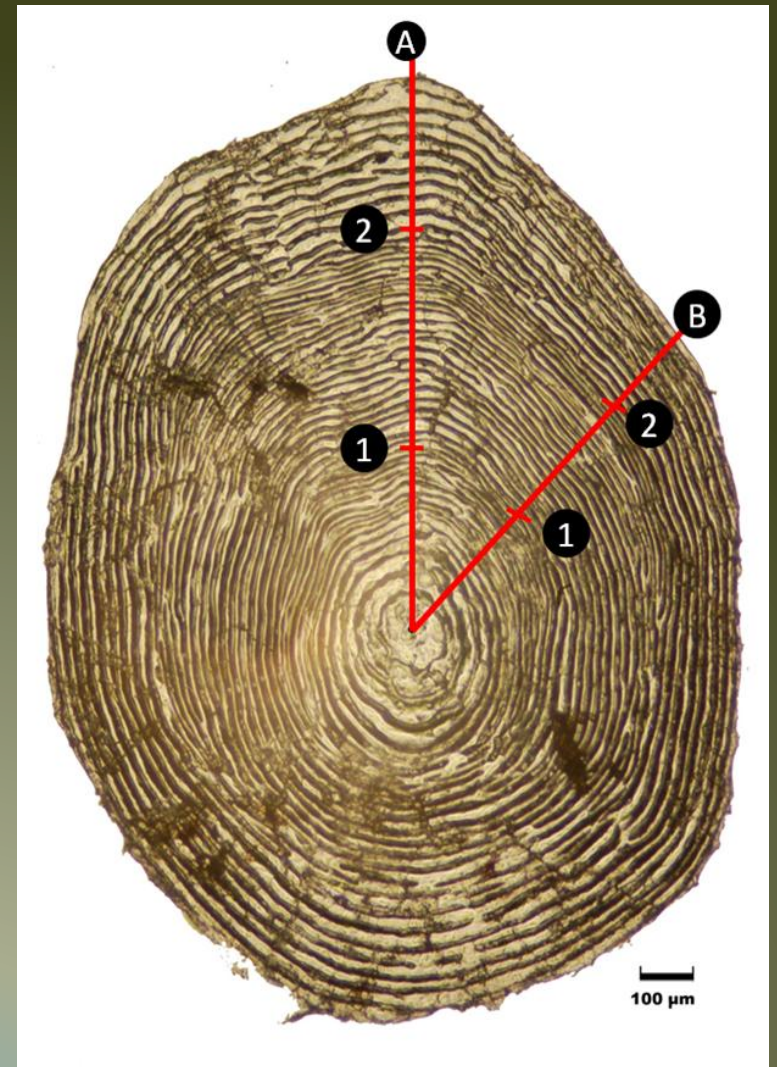
- April 18- June 1, 2005
- Located 0.56 km upstream

Demographic Data

- Measurements
 - Lengths, weights
- Smoltification
- Scale samples
 - Ageing, growth increments



Scale Analysis and Age Determination



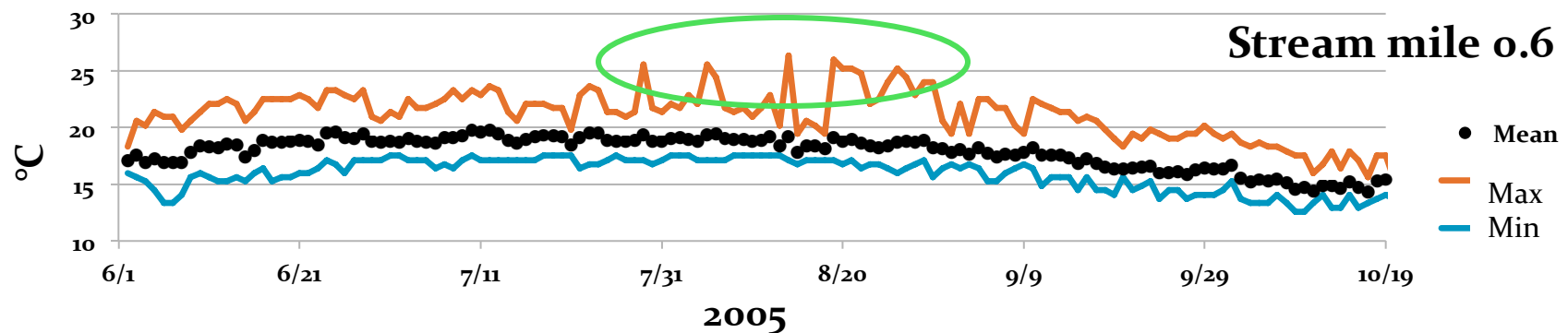
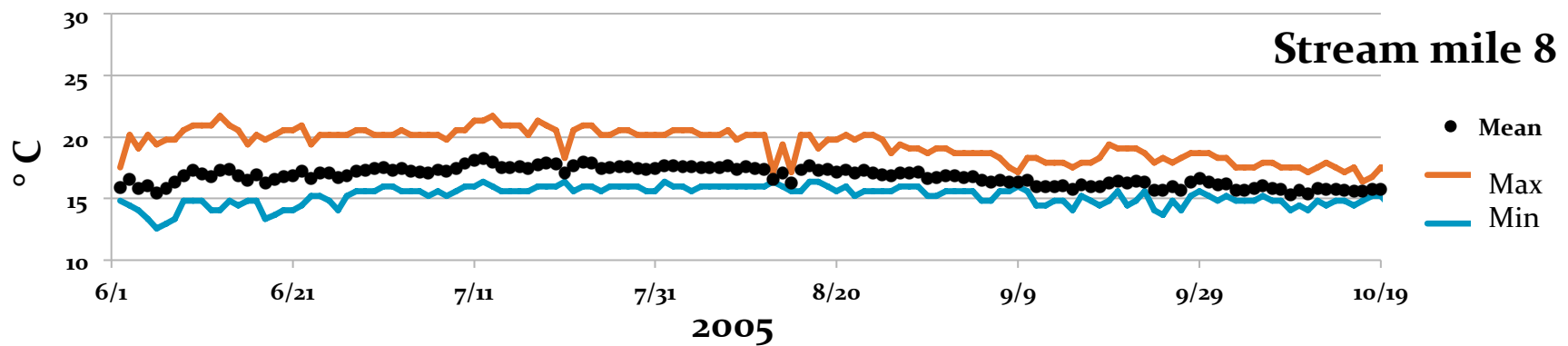
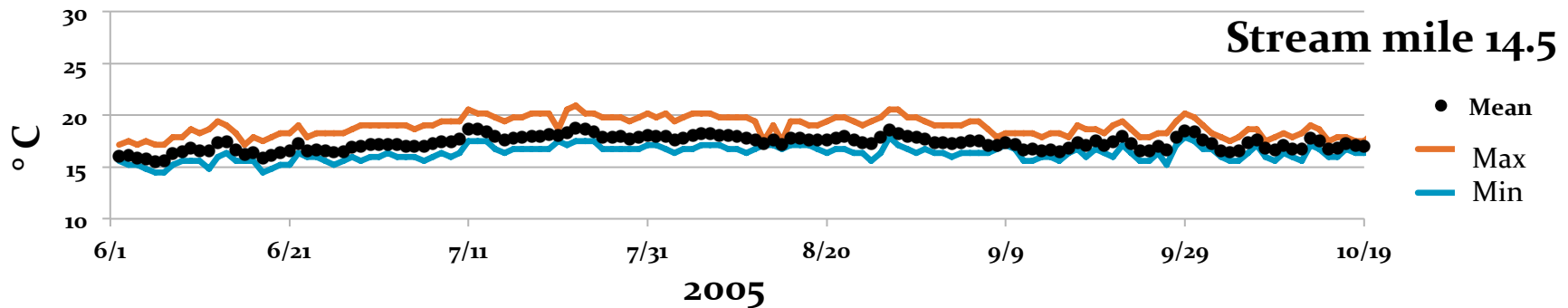
Results

Environmental Conditions

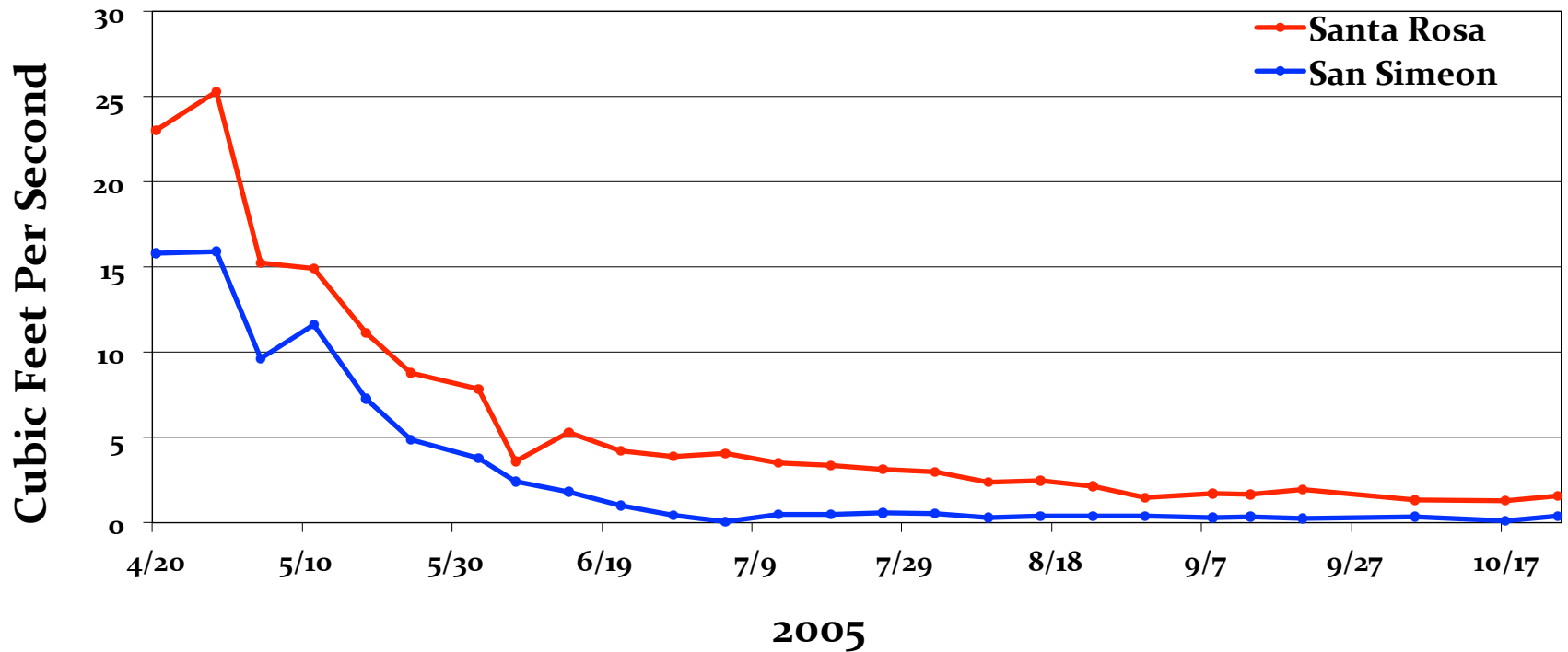


Average Stream Temperature

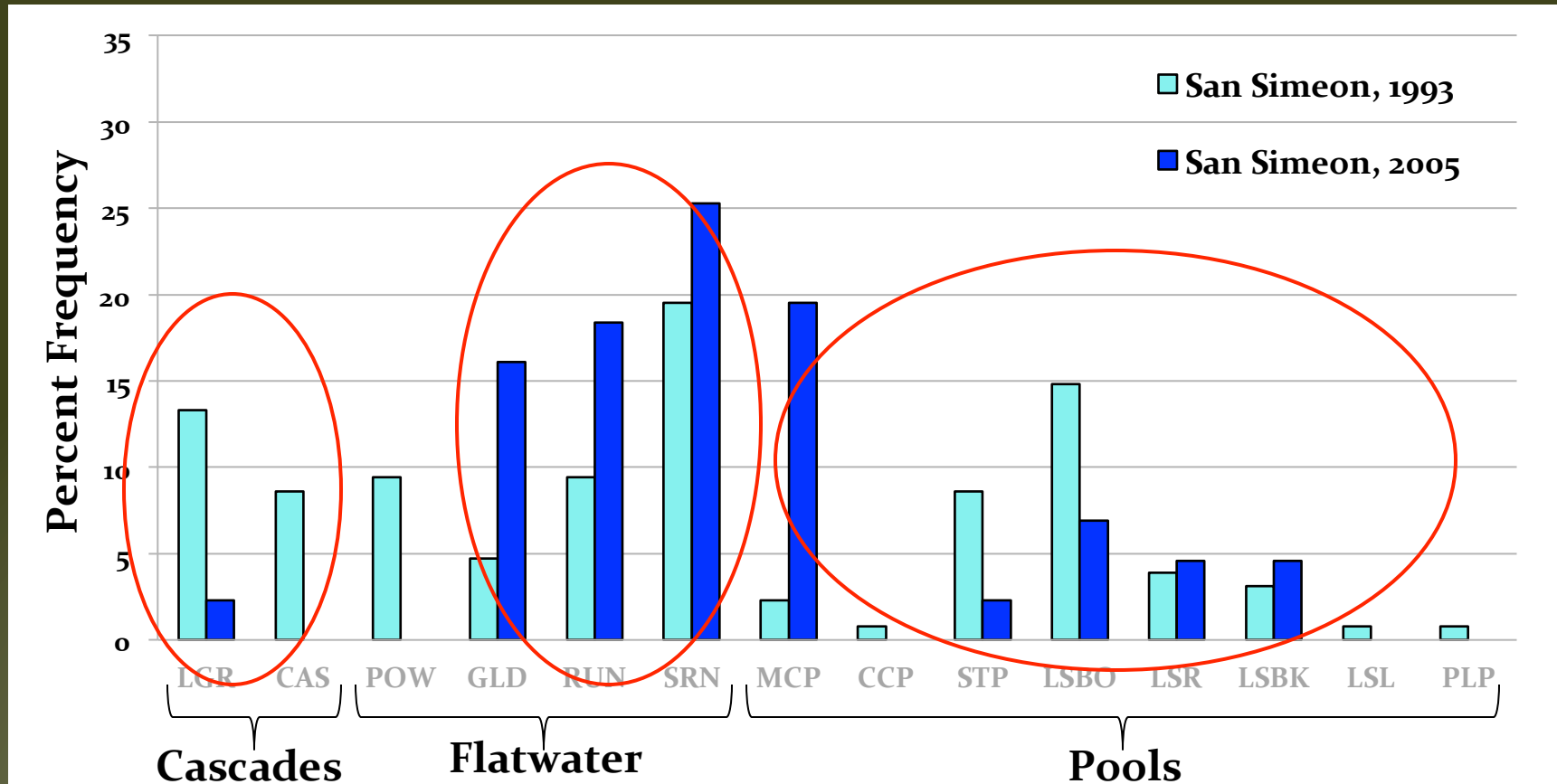
Santa Rosa Creek



Stream Flow Results



Habitat Survey Results

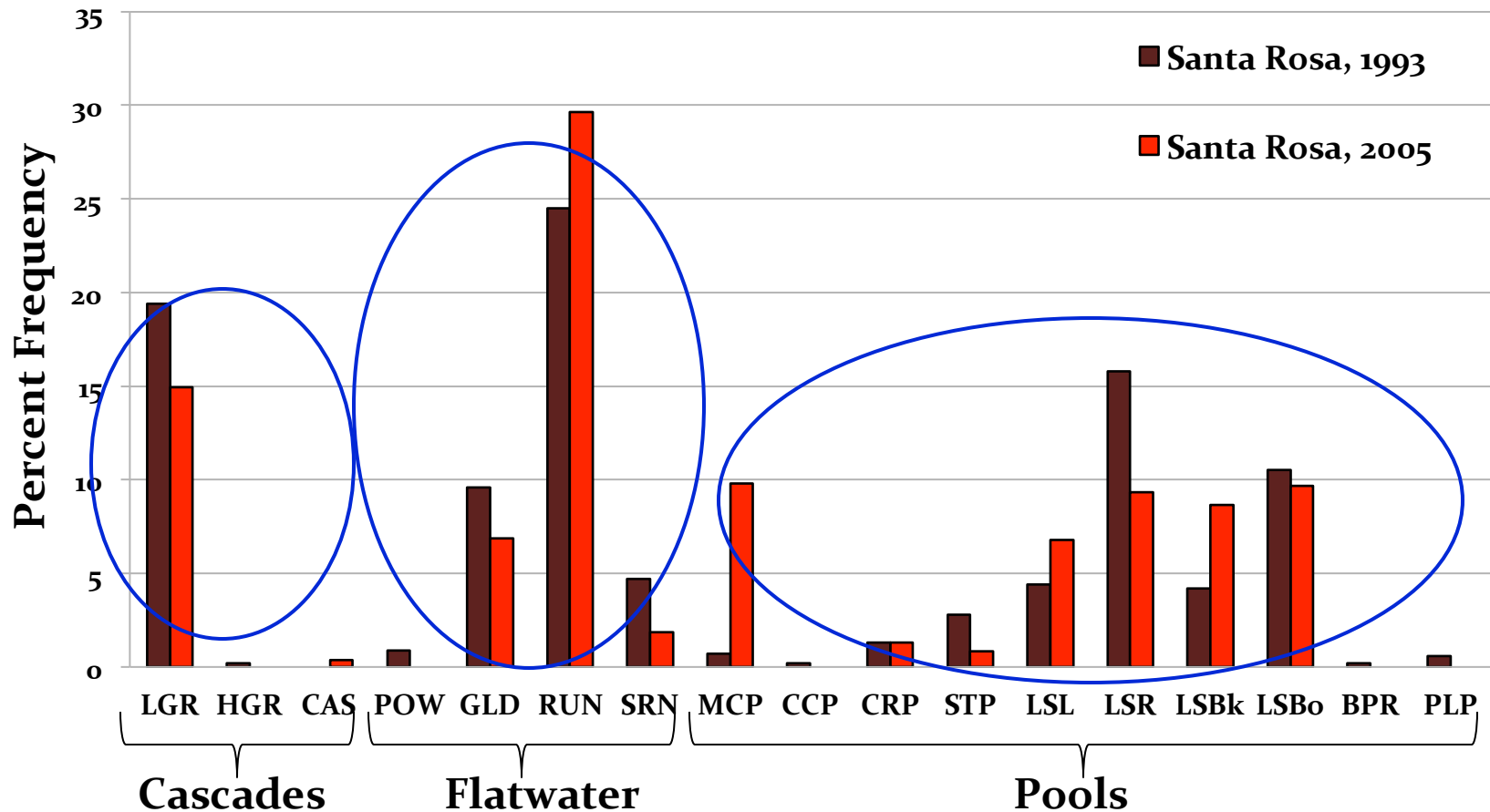


San Simeon Creek

1993, N = 128

2005, N = 87

Habitat Survey Results



Santa Rosa Creek

1993, N = 1018

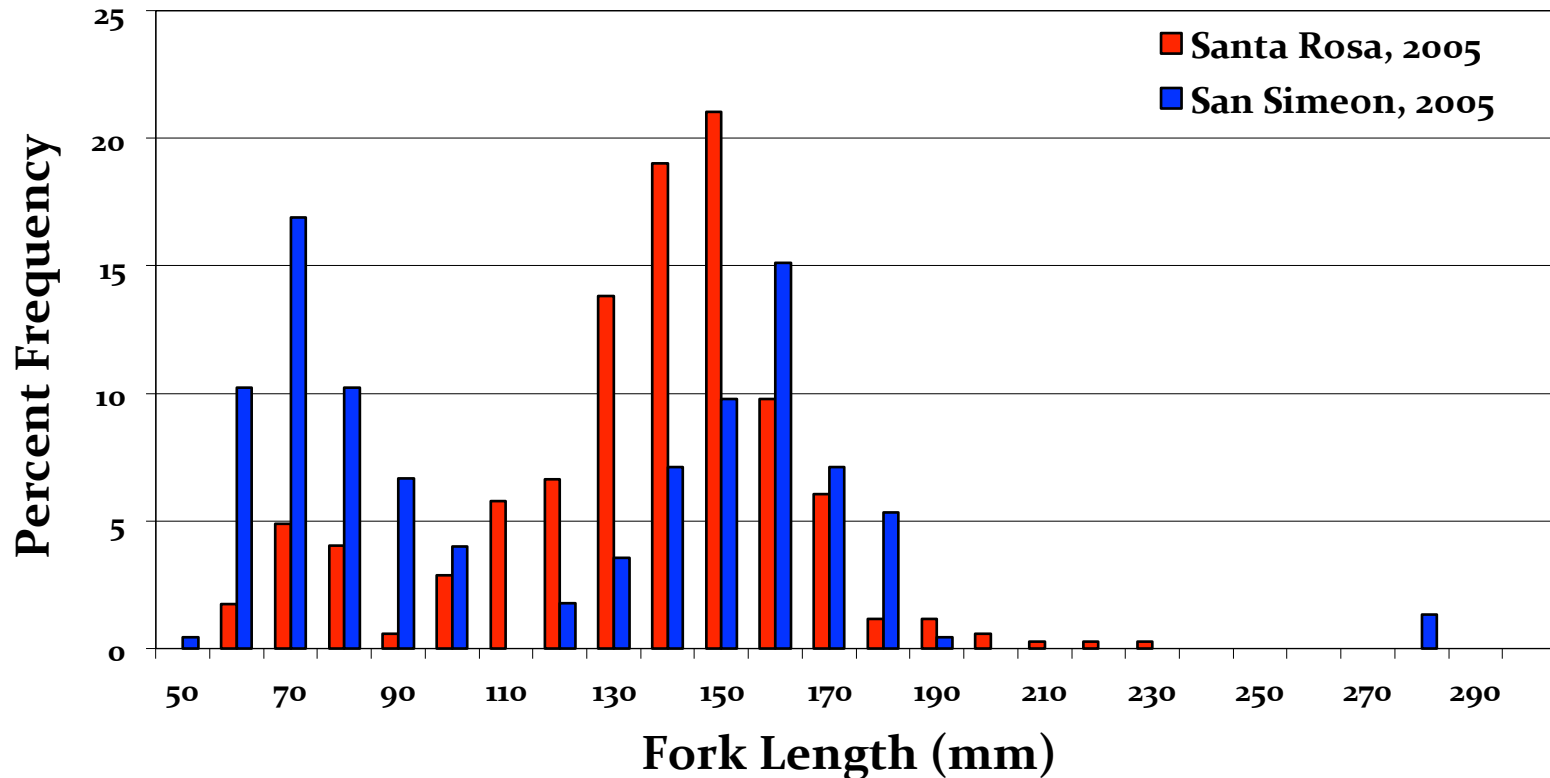
2005, N = 857

Results

Outmigrant Trapping



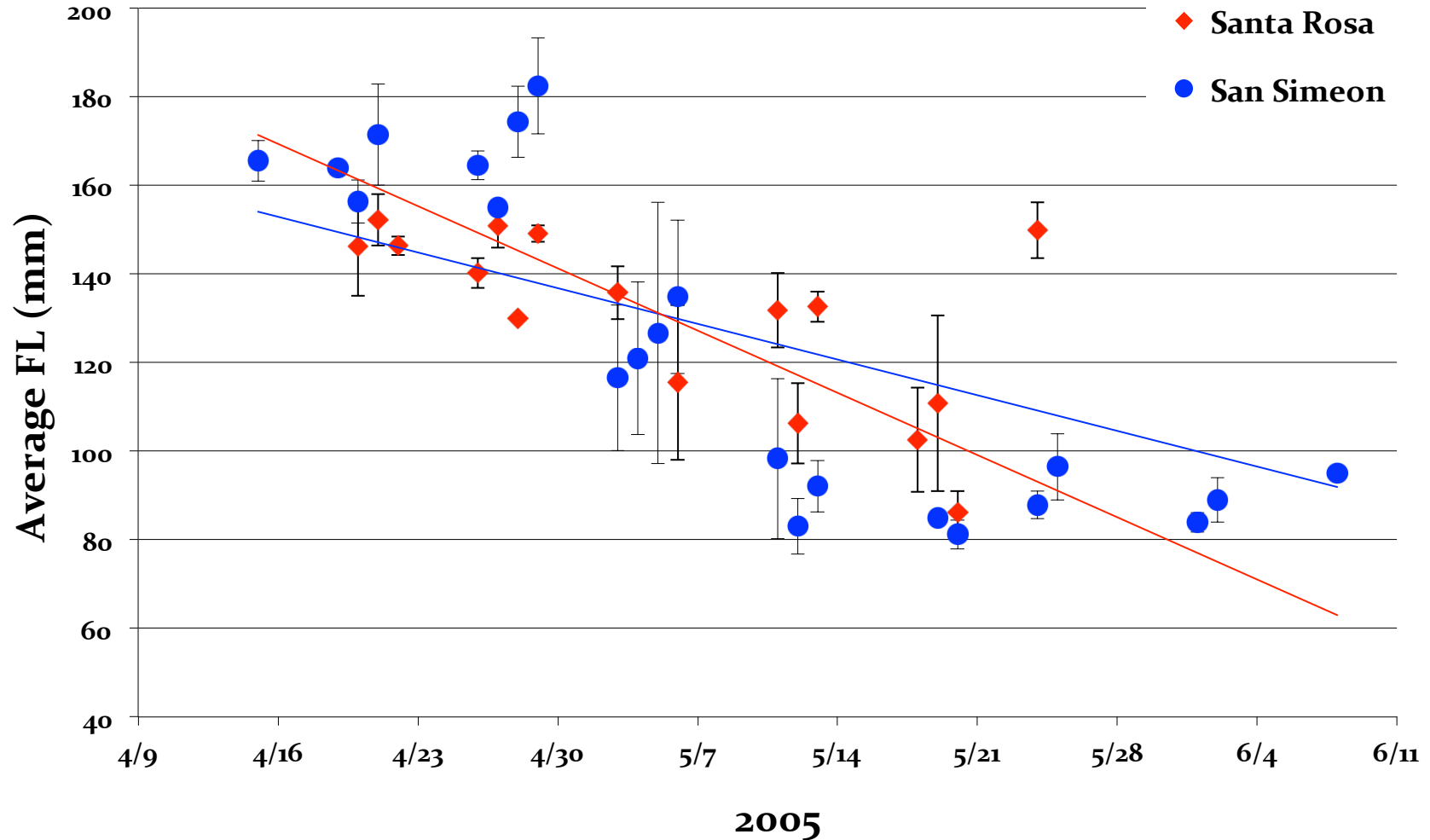
Length Distribution



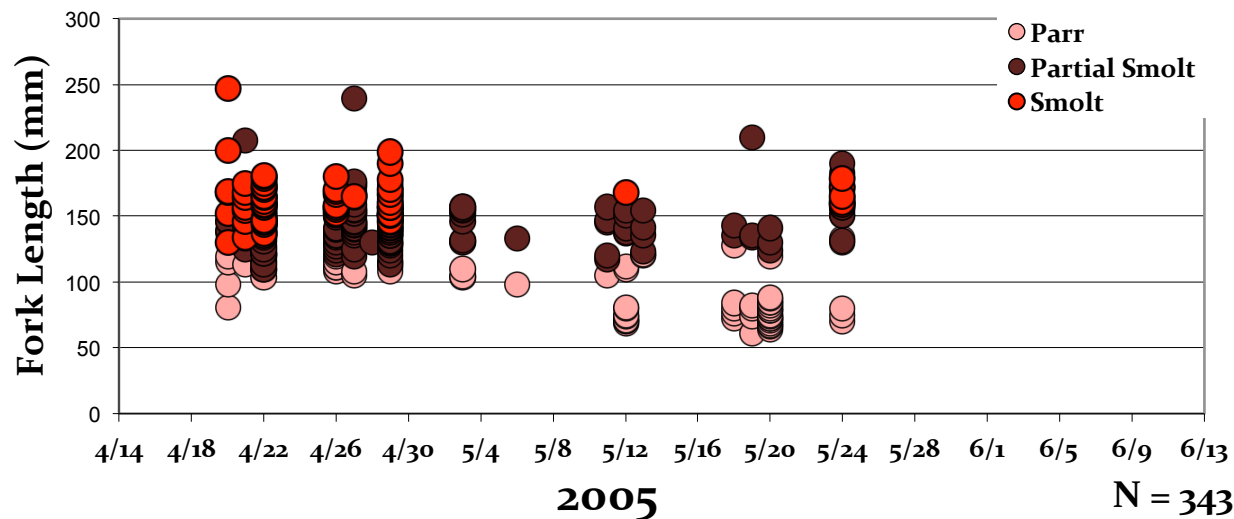
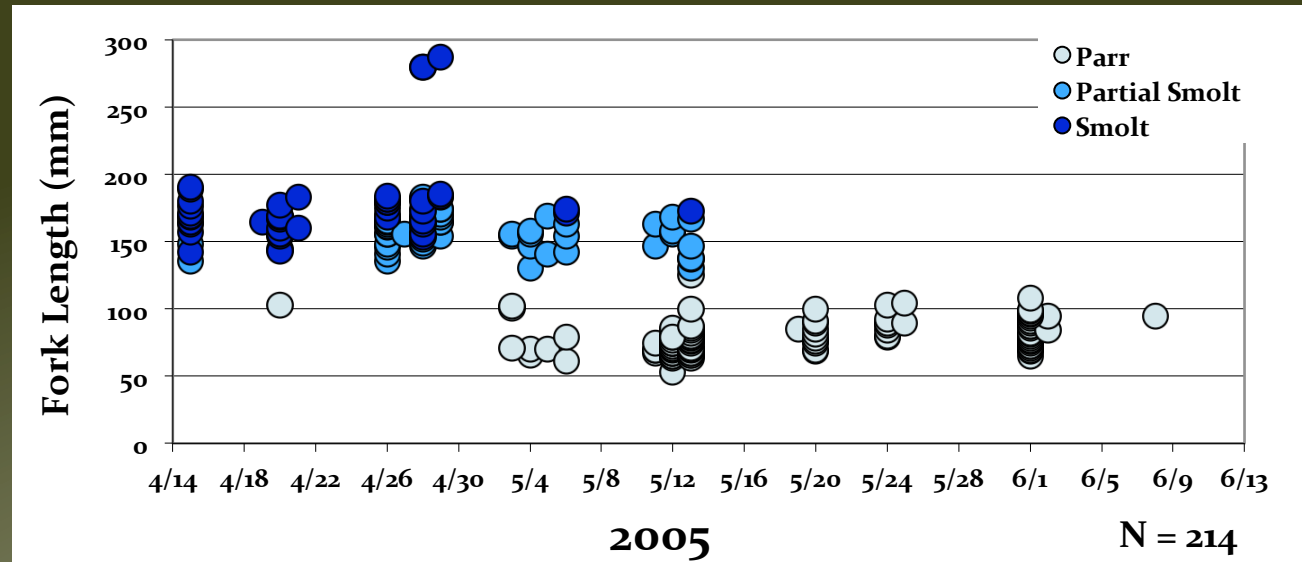
San Simeon Creek
N = 225

Santa Rosa Creek
N = 347

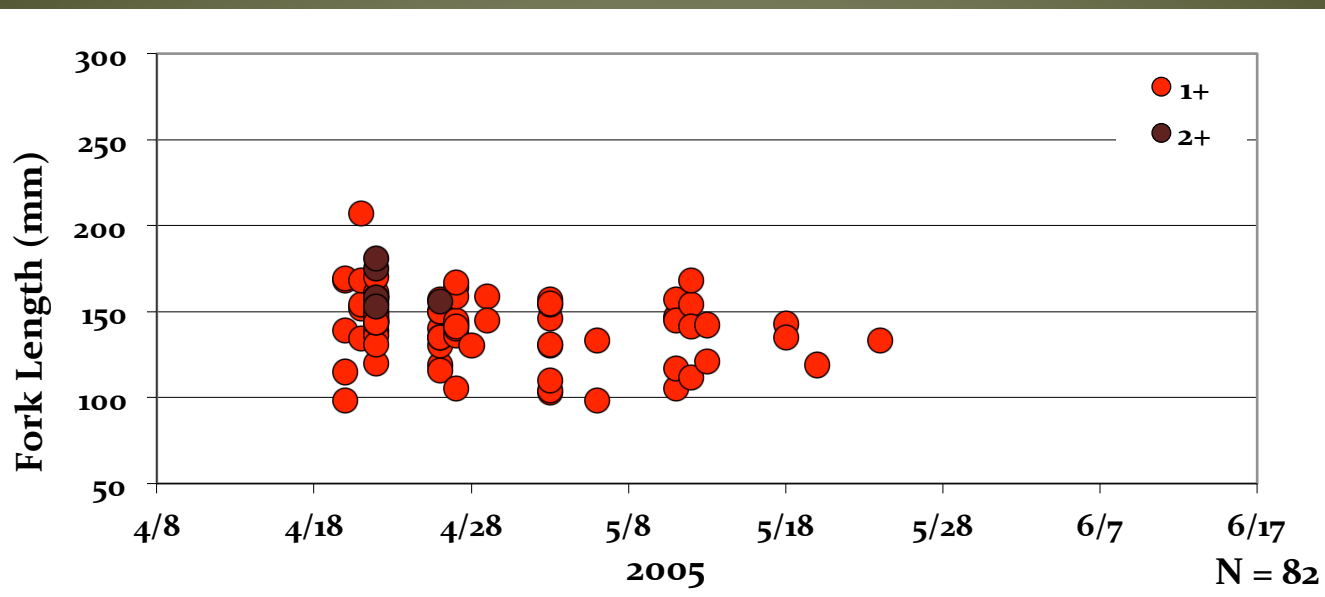
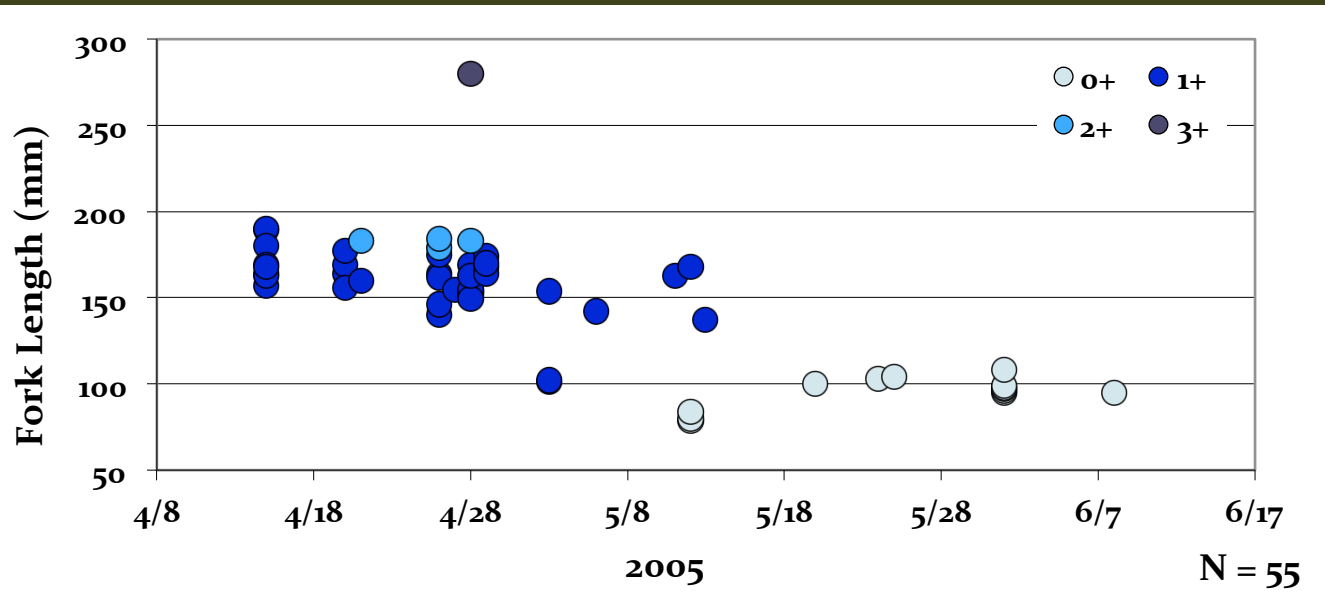
Length Distribution vs. Time



Smolt Characteristics/Length Distribution vs. Time

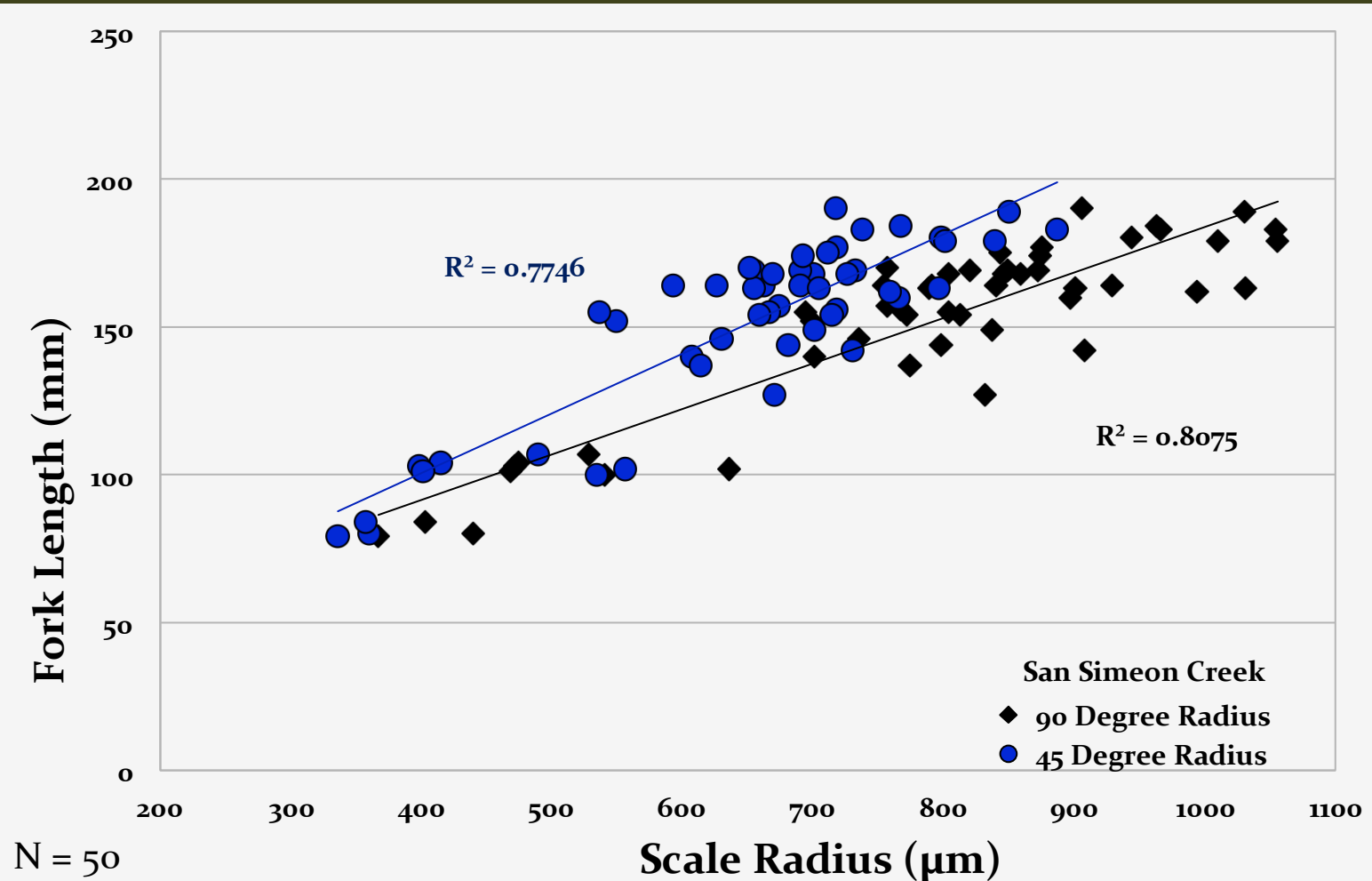


Age/Length Distribution vs. Time



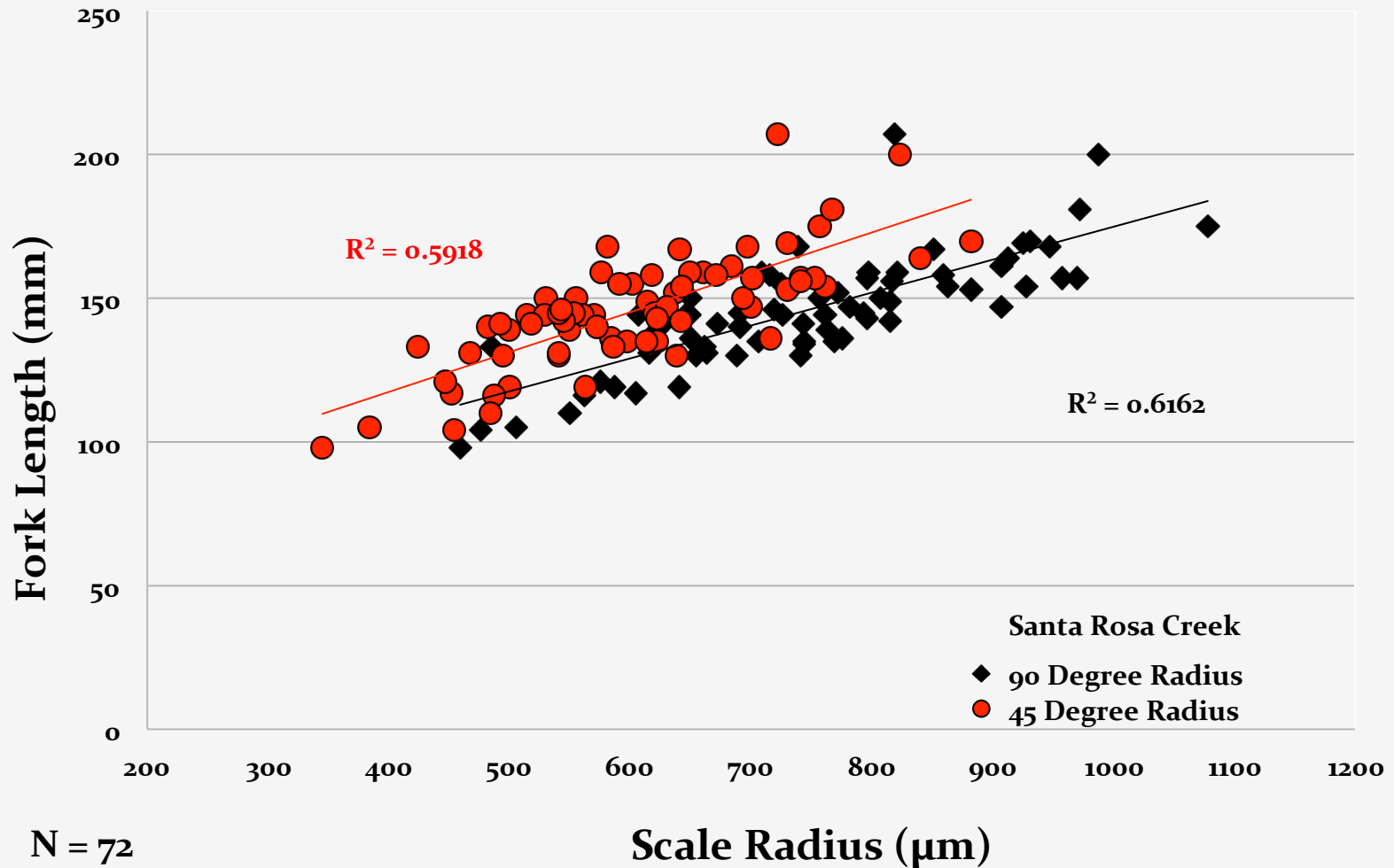
Fork Length vs. Scale Radius

San Simeon Creek

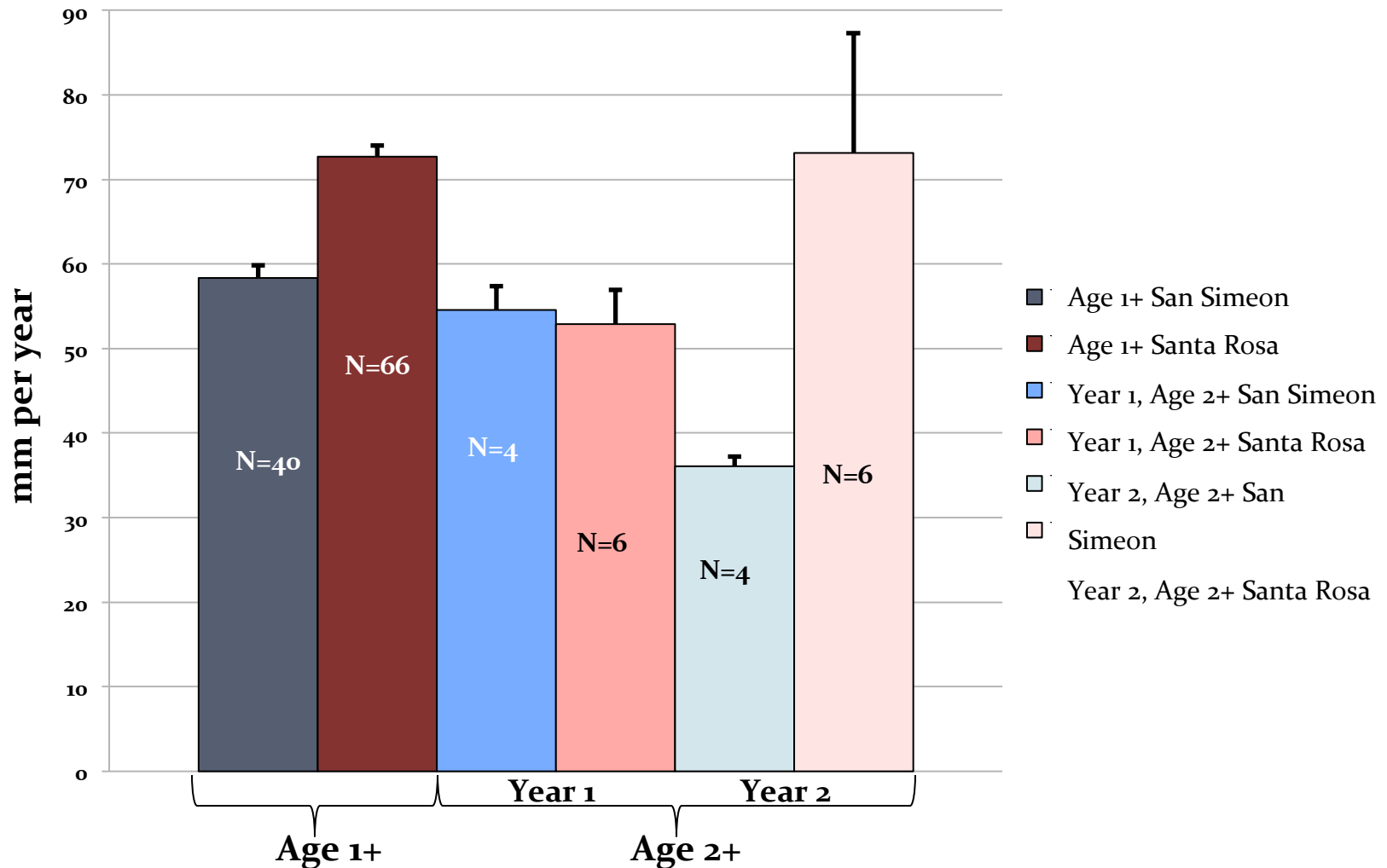


Fork Length vs. Scale Radius

Santa Rosa Creek



Growth Increments



Circuli Counts



- Average circuli to the first annuli of age 1+ fish
 - San Simeon: 12.70 (N = 40)
 - Santa Rosa: 15.77 (N = 66)
 - T-tests
- Average circuli to the each annuli of age 2+ fish
 - Both have aprox. 12.5 circuli to first annuli
 - San Simeon (to second annuli): 23 +/- 1.04 (N = 4)
 - Santa Rosa (to second annuli): 32.5 +/- 3.32 (N = 6)

Growth Since Last Annulus



- Age 1+
 - San Simeon: 19.7 (+/- 0.51) circuli
 - Santa Rosa: 14.5 (+/- 0.4) circuli
- Age 2+
 - San Simeon: 17 (+/- 0.82) circuli
 - Santa Rosa: 8.2 (+/- 1.78) circuli

Discussion



- Size at migration
 - Hayes *et al.*, 2008
- Use of estuaries
 - Bond *et al.*, 2008
- Potential winter growth
 - Hayes *et al.*, 2008
 - Sogard *et al.*, 2009

Recommendations for Future Research



- Habitat use?
 - Pit tag studies
- Time of annuli formation?
 - Sampling throughout the year
- Adult ages?
 - Trapping up migrating adults

References

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“Thank You!”



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Creeks

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Kurt Jirka and the Kraft Lab, Cornell