# *Steelhead, Coho Salmon and the Santa Margarita Groundwater Basin*

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## Presentation Points

- Sources of fisheries information
- Juvenile rearing habitat and flow
- Steelhead and coho salmon distribution within the Santa Margarita Groundwater Basin
- Importance of SMGB to coho and steelhead recovery

# SGMA Sources of Fisheries Information

Juvenile Steelhead and Stream Habitat (JSSH) Monitoring Program

*A voluntary partnership to coordinate fish and habitat monitoring in San Lorenzo, Soquel, Aptos and Pajaro watersheds*

*Program Partners*

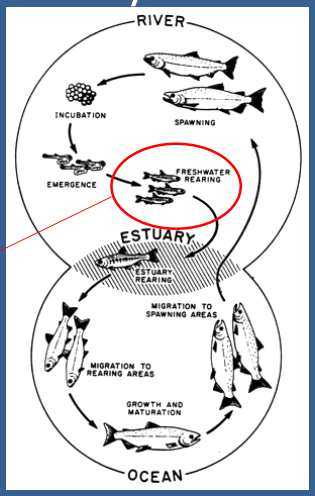
City of Santa Cruz, County of Santa Cruz, San Lorenzo Valley Water District, Scotts Valley Water District, Soquel Creek Water District, City of Capitola, City of Watsonville

## SGMA Sources of Fisheries Information

- California Department of Fish and Wildlife
  - Stream Surveys
  - Drought monitoring
  - Bean Creek fish rescues
- NOAA Fisheries CCC Coho Salmon Recovery Plan 2012
- NOAA Fisheries CCC Steelhead in Multi-Species Recovery Plan 2016
- San Lorenzo Salmonid Enhancement Plan 2004

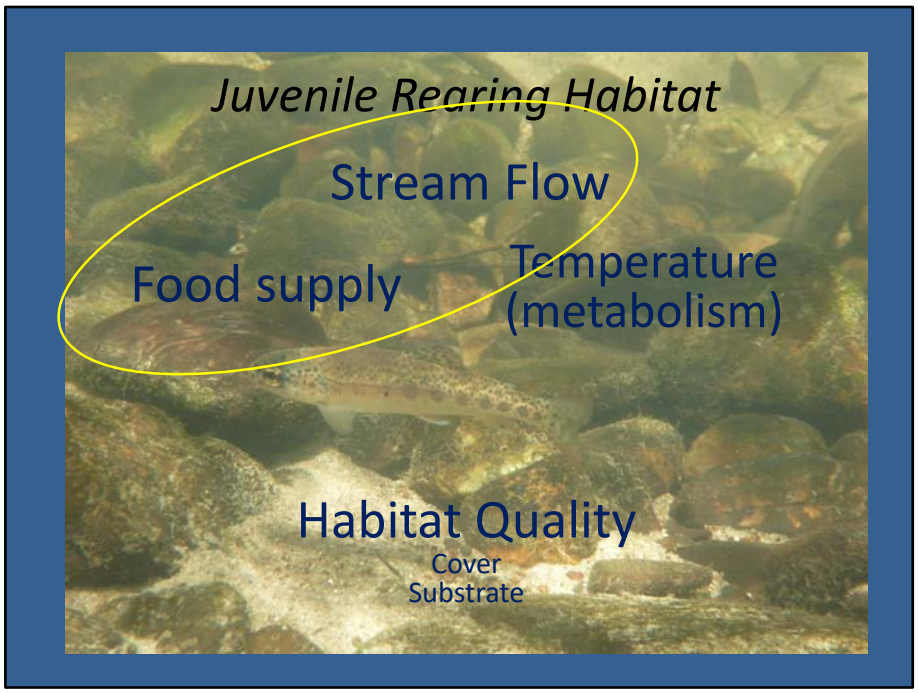
## Steelhead and Coho Salmon Anadromous Life History

- Hatch and rear in fresh water
- Migrate to the ocean
- Return to freshwater to spawn




Understanding salmon life history is important for assessing the critical times for maintaining instream flows and evaluating how groundwater (and pumping) could impact salmon habitat. We will briefly talk about steelhead as an example of a beneficial user of surface water. We will focus on the development of juveniles, which occurs from late spring into the fall. We are specifically concerned with this life stage because this is when groundwater influences to streamflow will have the greatest impact on the amount of flow.


*Juvenile Rearing Habitat*
Stream Flow
Food supply
Temperature
(metabolism)
Habitat Quality
Cover
Substrate


Juvenile Rearing Habitat
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Survive – Eat – Grow

## *Stream Drift*

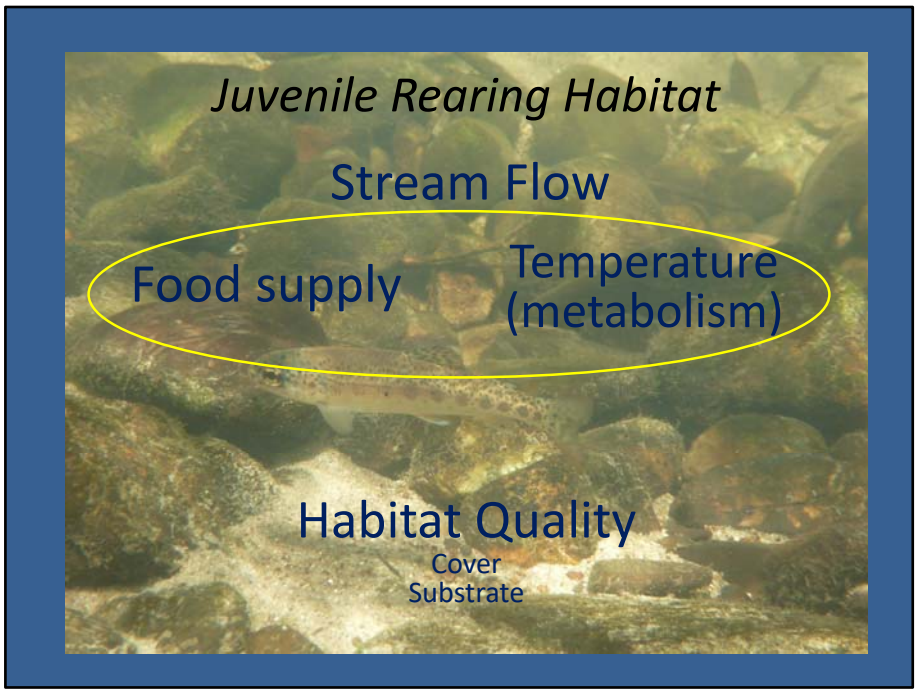
zooplankton - aquatic insects - terrestrial insects –

other macroinvertebrates-

Low flow = low drift rate = less food

Higher flow = higher drift rate = more food

Seasonal changes = higher in spring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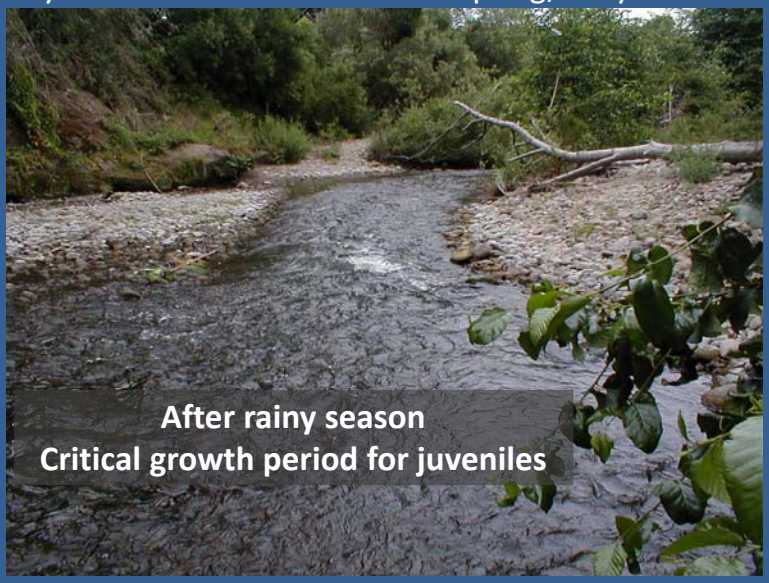
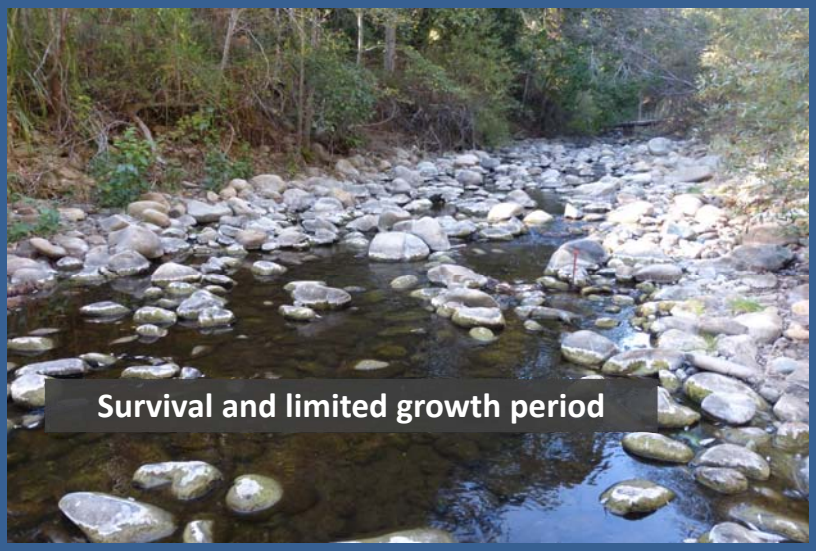
## Stream Temperature and Metabolism

- Fish are cold blooded!
- Low temperatures = low metabolism, need less food
  => Lower growth rate
- Higher temperatures = higher metabolism, need more food for survival
  if enough food => higher growth rate
  if not enough food => starvation

## Dry Season Streamflows – Late Spring/Early Summer



## Dry Season Streamflows – Late Summer/Early Fall



Steelhead
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Distribution
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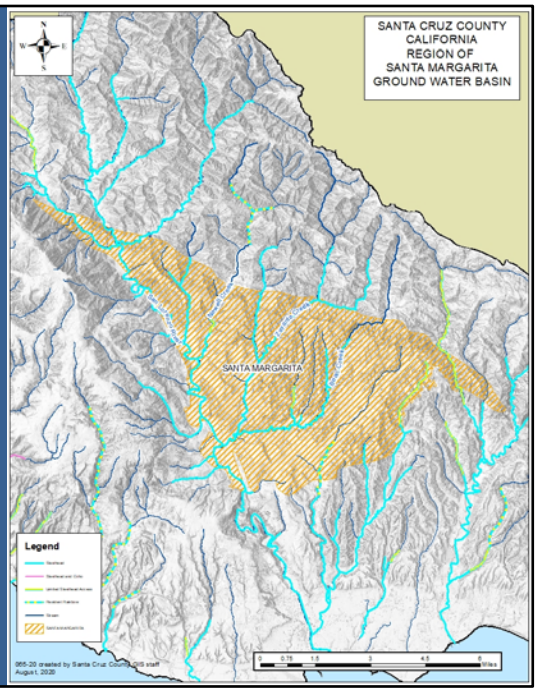

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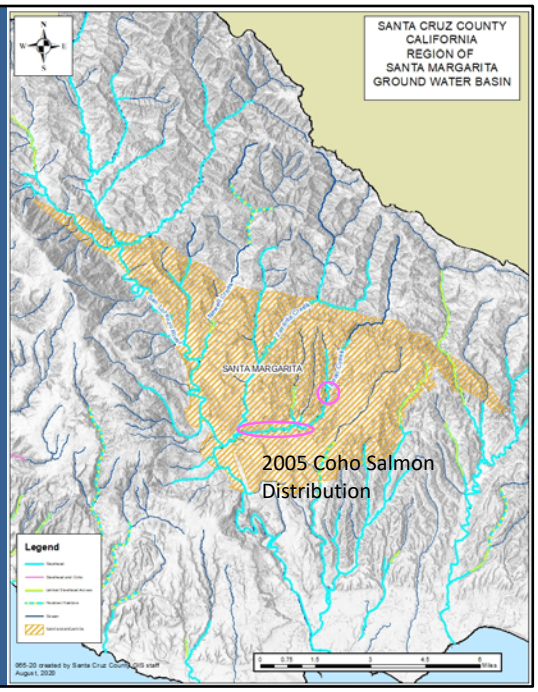
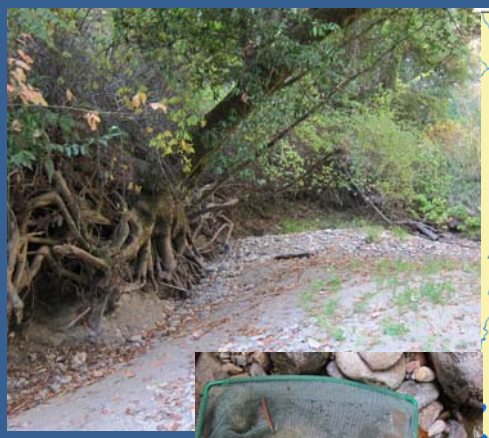
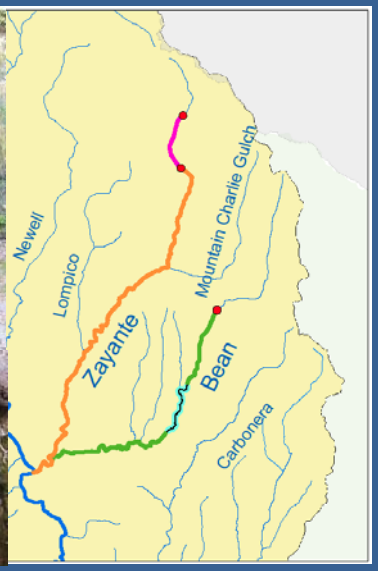


## Intermittent Reach of Bean Creek





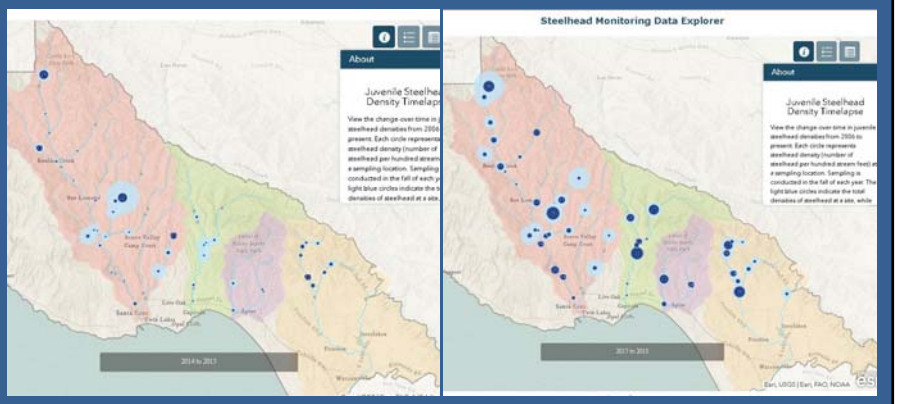
## *JSSH Steelhead Monitoring Program*

Juvenile Steelhead Density = # fish/100 feet

**Size Class 2**
**> 75 mm Standard Length**
*yearlings and fast growing young-of-the-year*

**Size Class 1**
**< 75 mm Standard Length**
*young-of-the-year (yoy)*

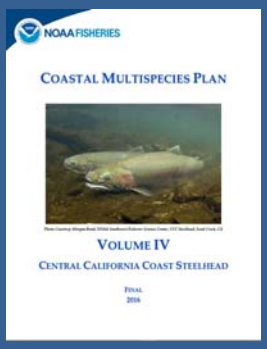
## Comparison of juvenile steelhead densities in 2014 (drought year) to 2017 (wet year)

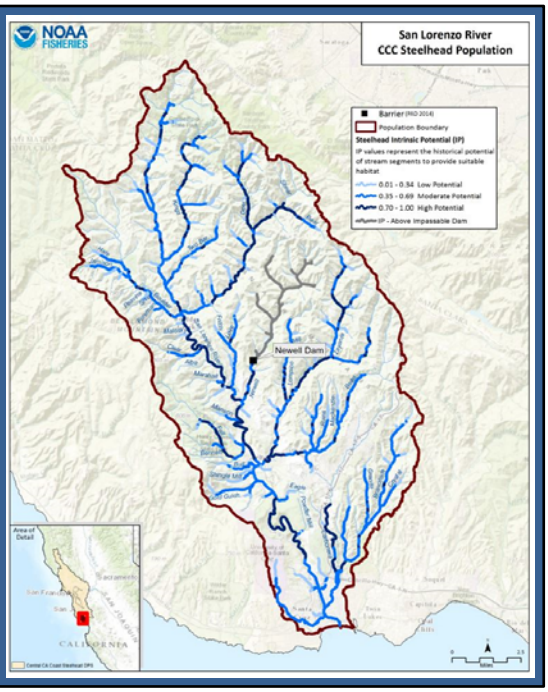



** More information and data available though county steelhead monitoring program: http://scceh.com/steelhead.aspx*

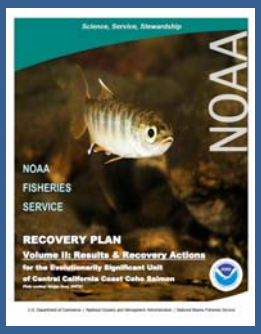
The County steelhead monitoring program measures the density of juvenile steelhead throughout the San Lorenzo, Soquel, Aptos, and Pajaro watersheds. The light blue circles represent the small young of the year and the dark blue circles represent larger fish. Here we can see the difference between steelhead densities between a drought year (2014) and a wet year (2017) during the fall of each year. The relationship between year type (wet or dry) and salmon survival is complicated and there are a number of factors, other than streamflow, that influence salmon survival. The higher densities during a wet year suggest that higher sustained baseflow during the summer is likely a contributing factor to juvenile survival.

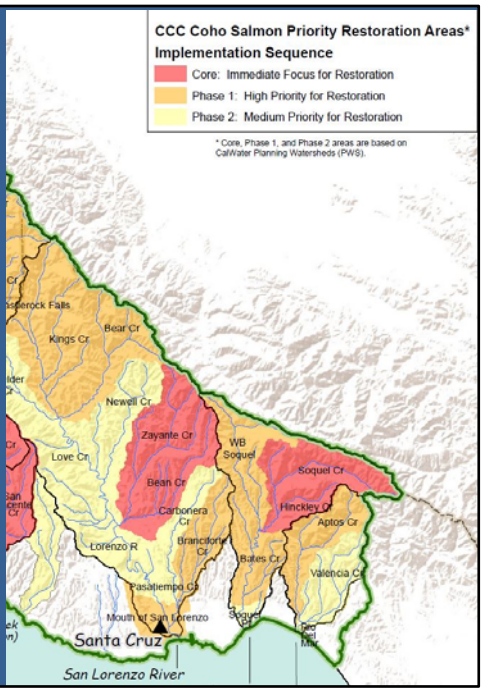
Steelhead Potential



# Coho Salmon Priority Recovery Areas



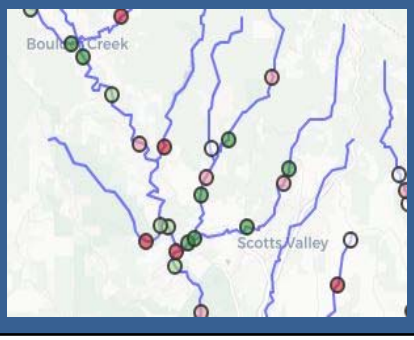



## Federal Coho Salmon and Steelhead Recovery Priorities for the San Lorenzo Watershed

- Protect and increase dry season stream flow, especially during dry and drought periods
- Protect sources of cool water inflows

- Increase habitat complexity through retention and introduction of large wood
- Protect riparian areas, floodplains and stream channels from development
- Protect large undeveloped properties
- Maintain roads to reduce sediment input and hydrologic impacts
- Support re-introduction of coho into San Lorenzo watershed

## And, Pacific lamprey - another anadromous fish




Common: 76 - 100% of all sampled years

Frequently present: 51 - 75% of all sampled years

Occasionally present: 26 - 50% of all sampled years

Rare: >0 - 25% of all sampled years

No fill: Absent

# Steelhead Monitoring Program Website

http://scceh.com/steelhead.aspx