

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

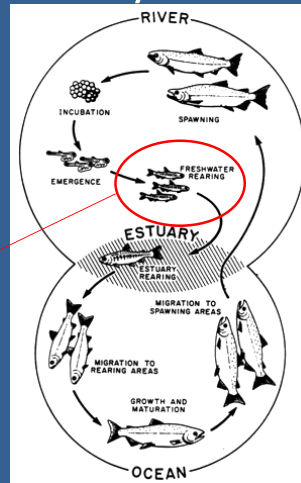
City of Santa Cruz, County of Santa Cruz, San Lorenzo Valley Water District,
Scotts Valley Water District, Soquel Creek Water District,
City of Capitola, City of Watsonville

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

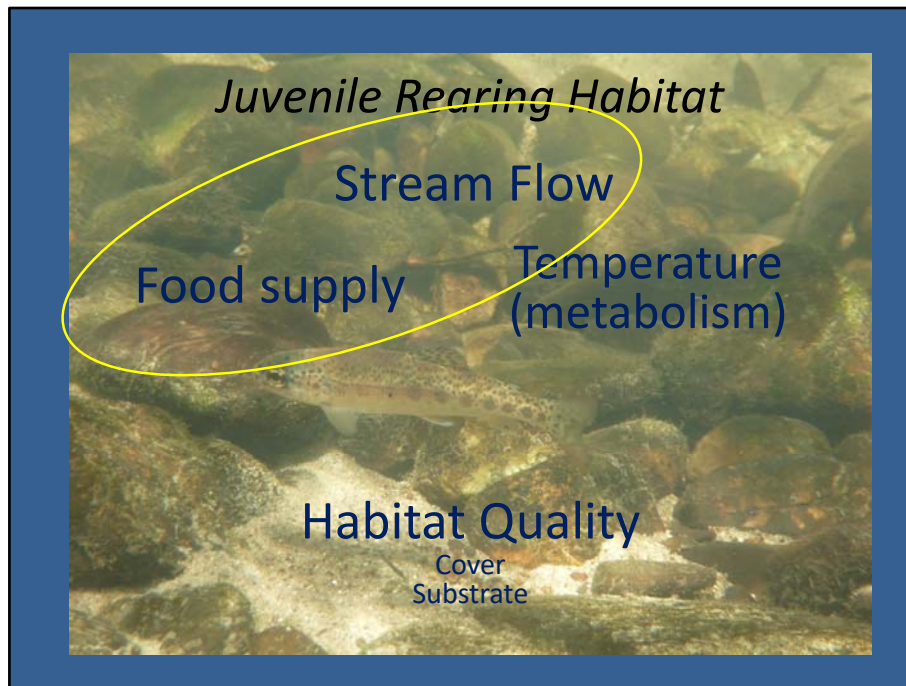
Steelhead and Coho Salmon Anadromous Life History

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



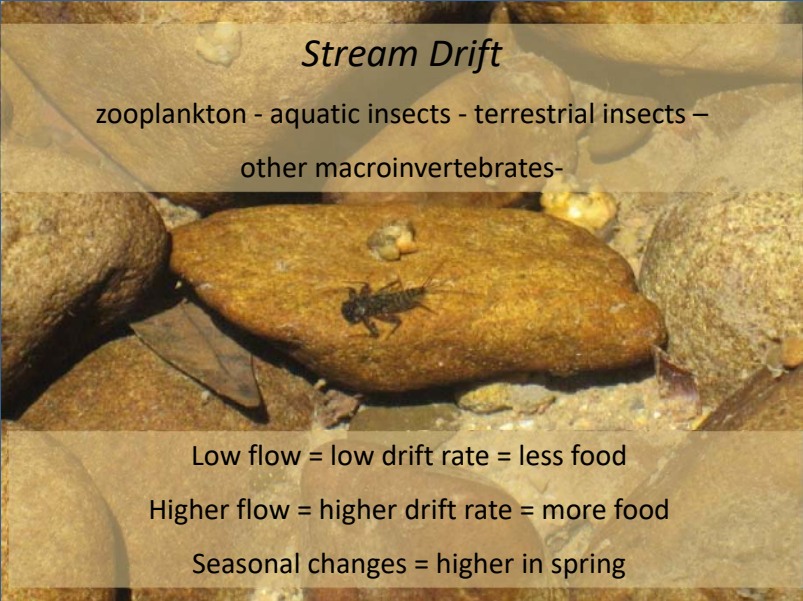
Understanding salmon life history is important for assessing the critical times for maintaining instream flows and evaluating how groundwater (and pumping) could impact salmon habitat. We will briefly talk about steelhead as an example of a beneficial user of surface water. We will focus on the development 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.





Survive – Eat – Grow



The background image shows a close-up of a stream bed. It features several smooth, rounded, light-brown to tan-colored rocks of various sizes. A single, dark-colored stonefly nymph is perched on one of the larger rocks in the center. The water surface is visible in the upper part of the image, showing some ripples and light reflection. The overall scene is a natural, outdoor setting.

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



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



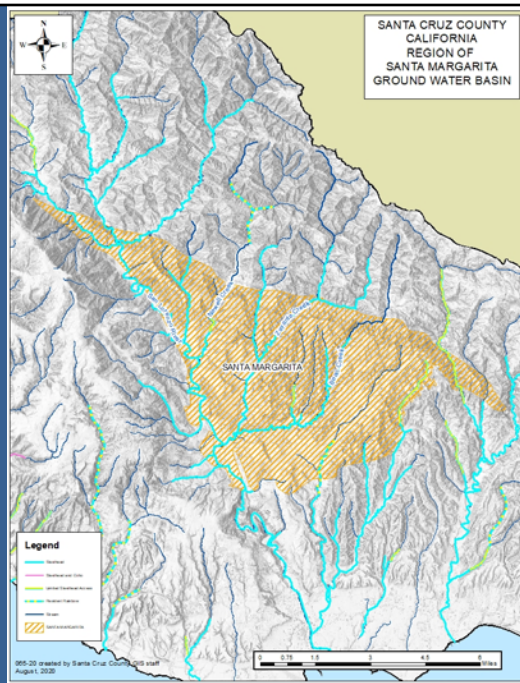
After rainy season
Critical growth period for juveniles

Dry Season Streamflows – Late Summer/Early Fall

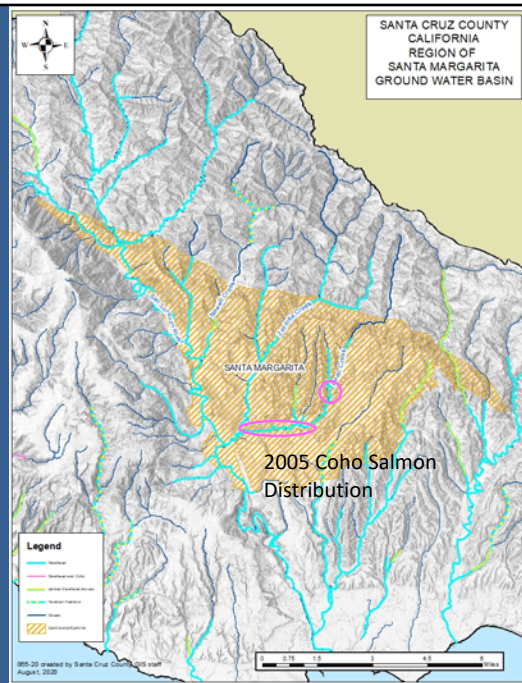


Survival and limited growth period

Steelhead
and
Coho Salmon
Distribution
within the Santa
Margarita
Groundwater
Basin



Steelhead
and
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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

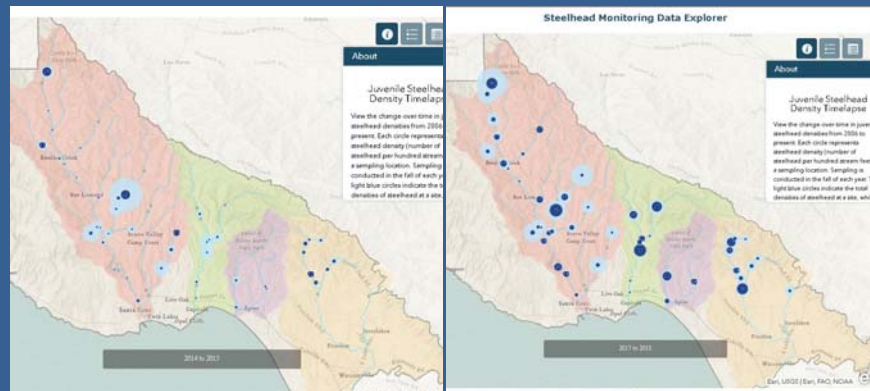
Size Class 1

< 75 mm Standard Length
young-of-the-year (yoy)



75 mm

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

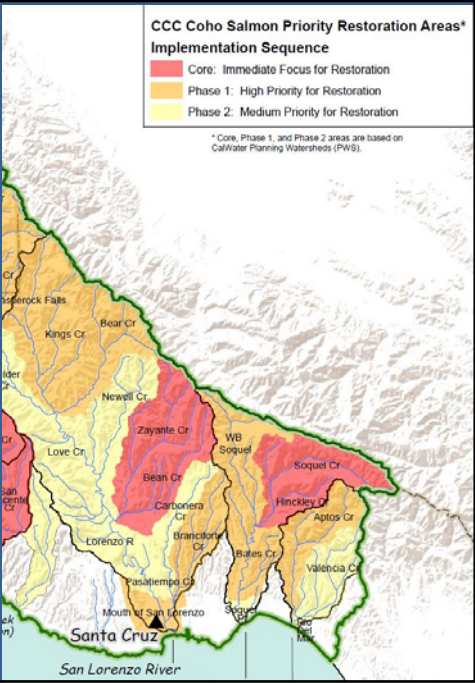
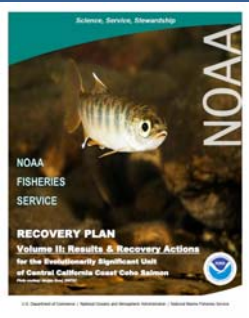


* More information and data available through county steelhead monitoring program: <http://scceh.com/steelhead.aspx>

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.



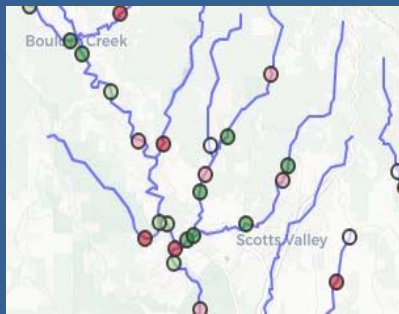
Coho Salmon Priority Recovery Areas



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>



The screenshot shows the website for the Steelhead Monitoring Program. At the top is the County of Santa Cruz logo and navigation links: Government, Departments, Living, Working, Business, Visiting. Below this is the 'Environmental Health' section header. A large image of two steelhead fish is featured. The main heading is 'Steelhead Monitoring Program'. A text box describes the program as a partnership between the County of Santa Cruz and local water agencies, measuring juvenile steelhead density across 42 sites. Below this are four interactive links: 'Data Explorer' (with a map icon), 'Data Analysis' (with a bar chart icon), 'Report Library' (with a photo of people fishing icon), and 'Distribution Map' (with a map icon).

County of Santa Cruz
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Steelhead Monitoring Program

Santa Cruz County Juvenile Steelhead & Stream Habitat (JSSH) Monitoring Program is a partnership between the County of Santa Cruz and local water agencies. The annual program measures the density of juvenile steelhead across more than 42 sites throughout the San Lorenzo, Siquel, Agtux, and Pajaro watersheds. The program also assesses habitat conditions for steelhead and coho salmon and helps inform conservation priorities throughout the County.

Program Overview
Learn about the steelhead monitoring program with this interactive story.

Data Explorer
Explore the steelhead monitoring data with this interactive web map.

Data Analysis
Data Analysis

Report Library
Read the published monitoring reports, organized by year.

Distribution Map
Distribution Map