

# Fisheries Monitoring: What are We Learning?

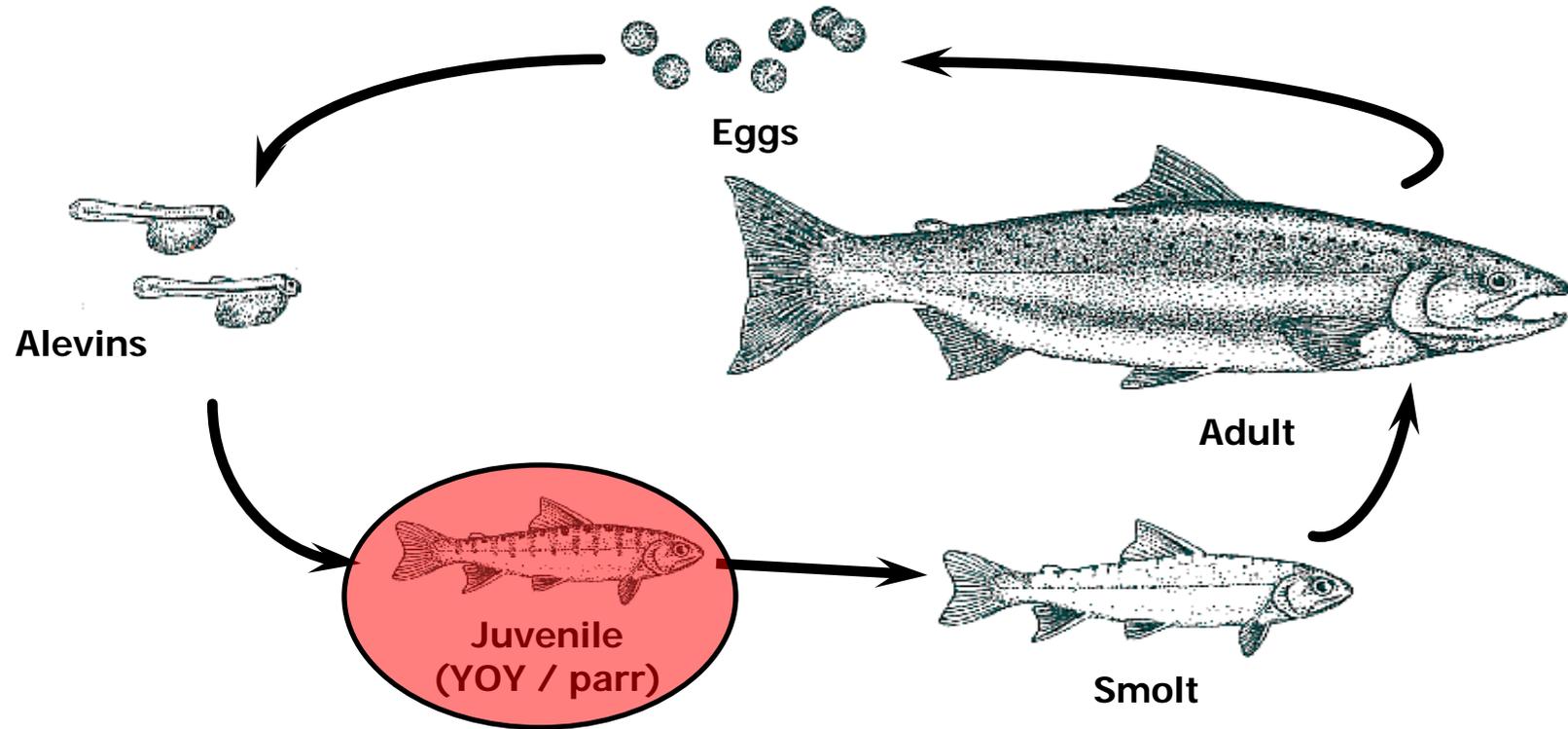


Gregg Horton, Justin Smith, David Cook

[www.sonomacountywater.org](http://www.sonomacountywater.org)

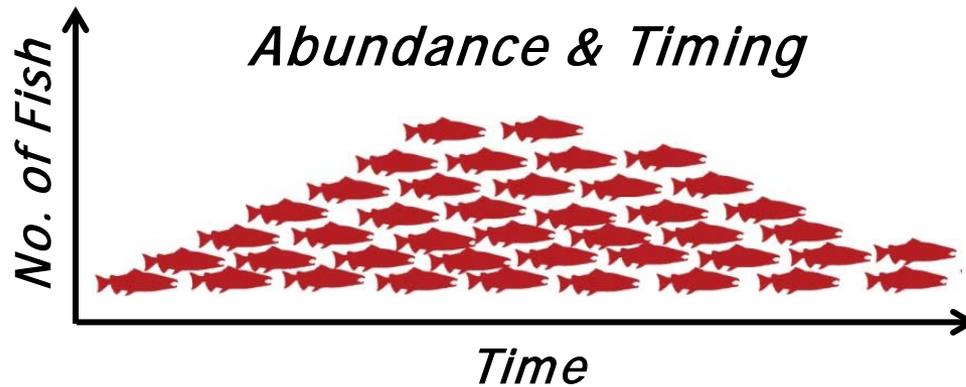


# Steelhead Life Cycle

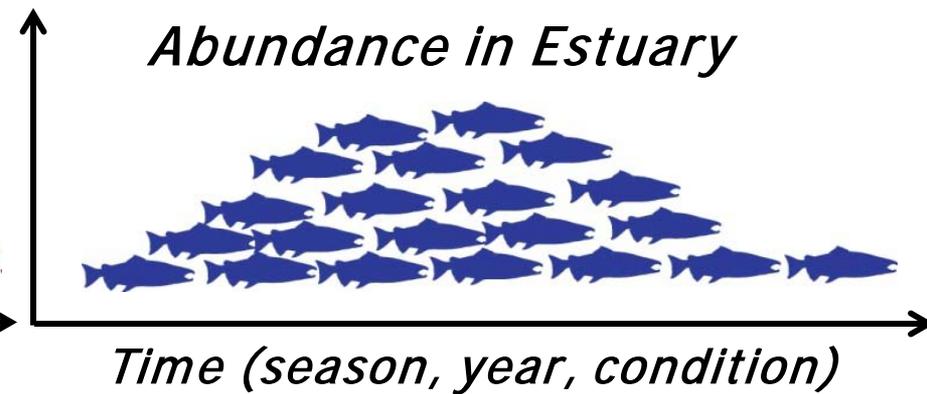


# Biological Opinion Objectives

## 1.) FISH ENTERING THE ESTUARY



## 2.) FISH RESIDING IN ESTUARY



## Size / Age



## Residence Time & Growth



# Sampling Locations

- Downstream Migrant Trap
- PIT Antenna
- Seining Station

Austin Creek



Mainstem (Mirabel)



PIT Antennas



Mark West Creek



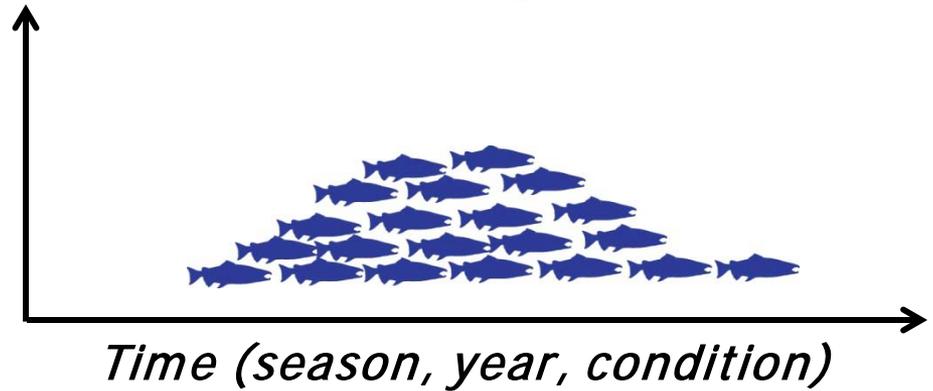
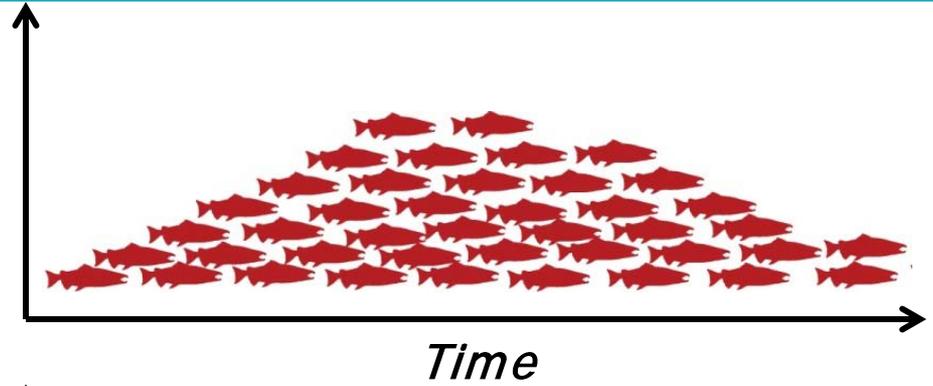
Dutch Bill Creek



Estuary



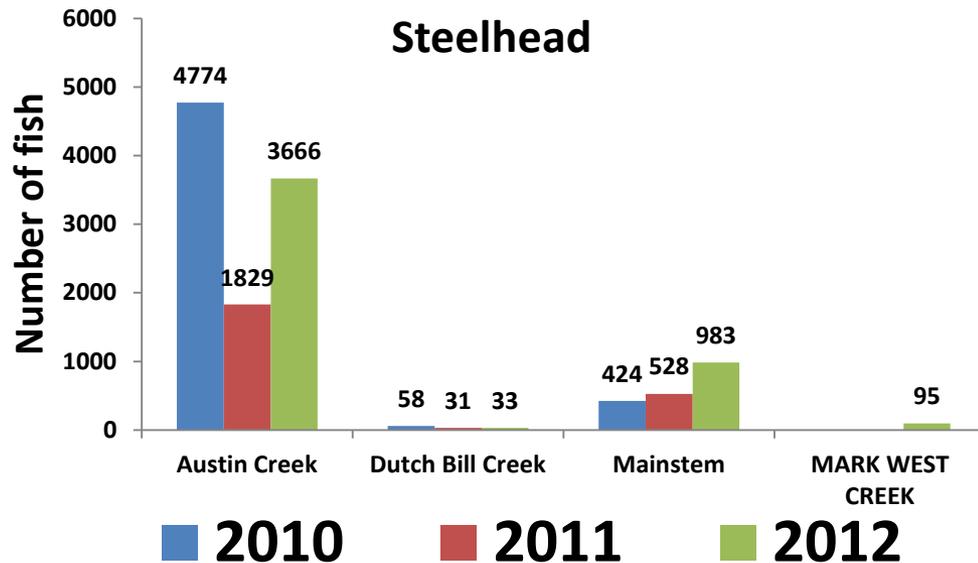
# Methods-PIT Tags



# Stream Trapping - *Relative Abundance*

- More steelhead detected at Austin Creek relative to other trapping sites.
- Estimate of young-of-the-year steelhead emigrating (leaving) Austin Creek:

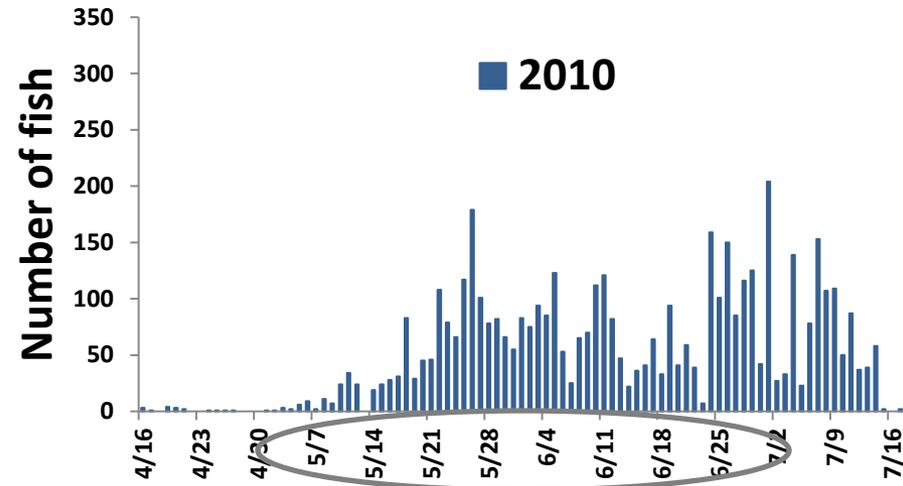
Year	Population Estimate
2010	14,231
2011	5,755
2012	4,538



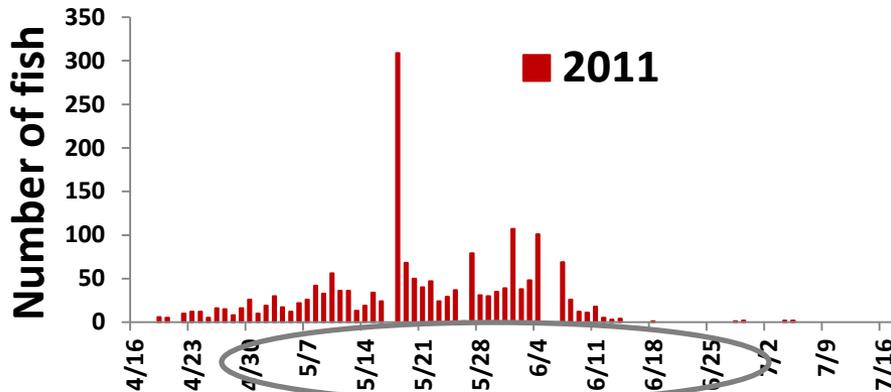
# Stream Trapping - *Timing and downstream movements of fish*

- Austin Creek
- Downstream migrant trap
- Steelhead wild parr
- Most movement occurred from May through June

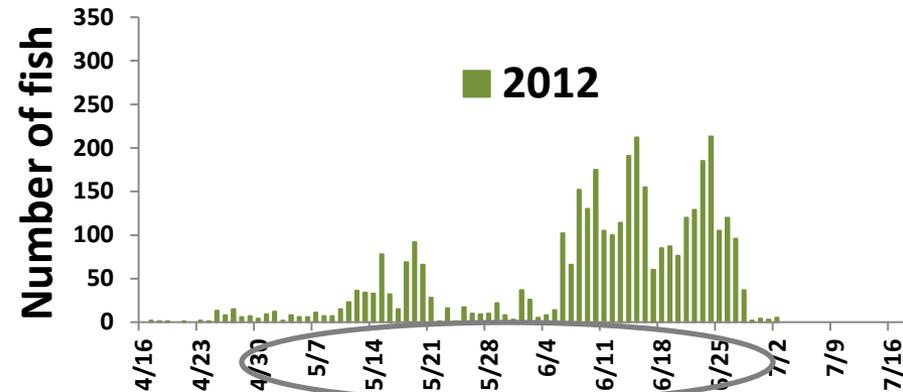
Austin Creek Steelhead Catch



Austin Creek Steelhead Catch

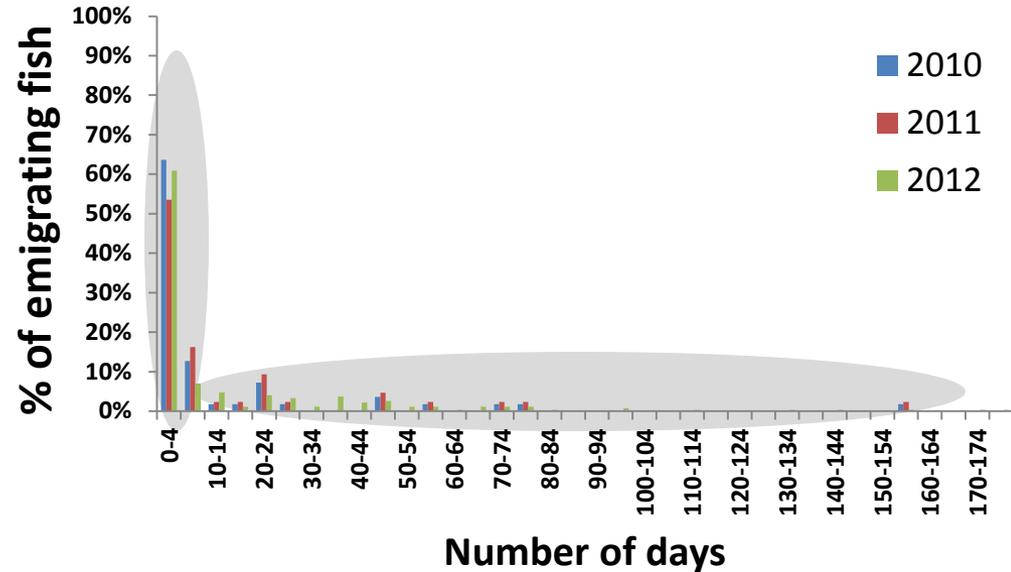


Austin Creek Steelhead Catch



# Stream Trapping- *Timing and downstream movements of fish*

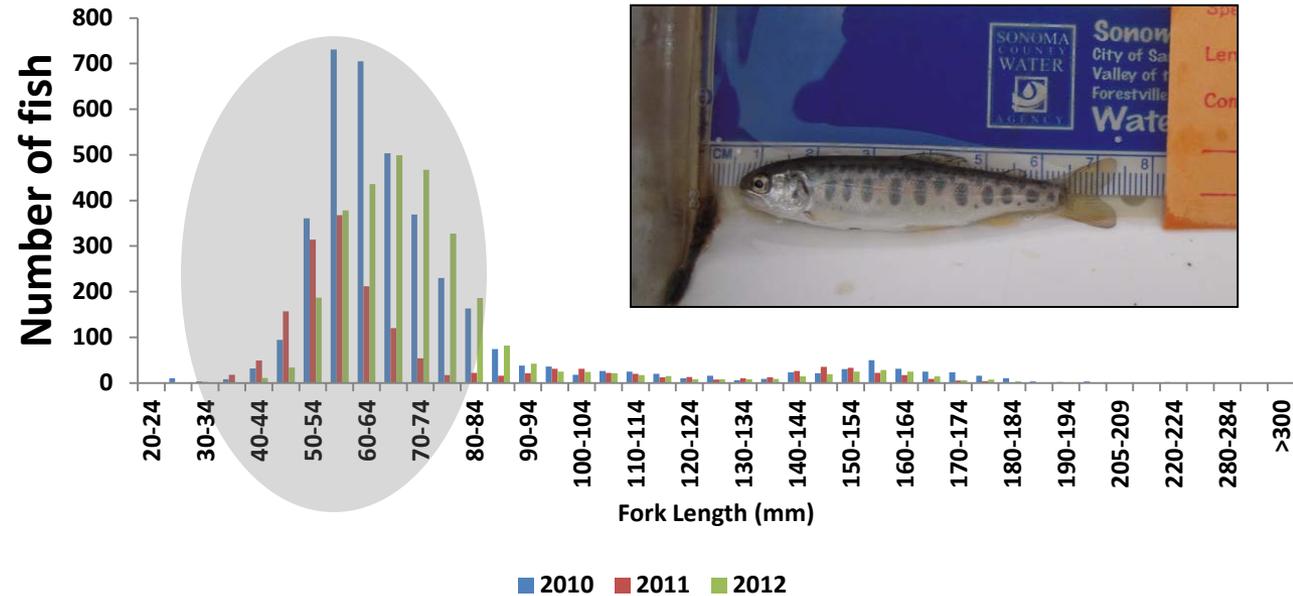
Travel time for YOY steelhead from Austin Creek to the estuary PIT tag antenna (~2.5 km) is relatively fast:



	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>No. of fish tagged</b>	997	500	1639
<b>No. of fish detected</b>	55	43	271
<b>Min travel days</b>	0	0	0
<b>Median travel days</b>	1	7	1

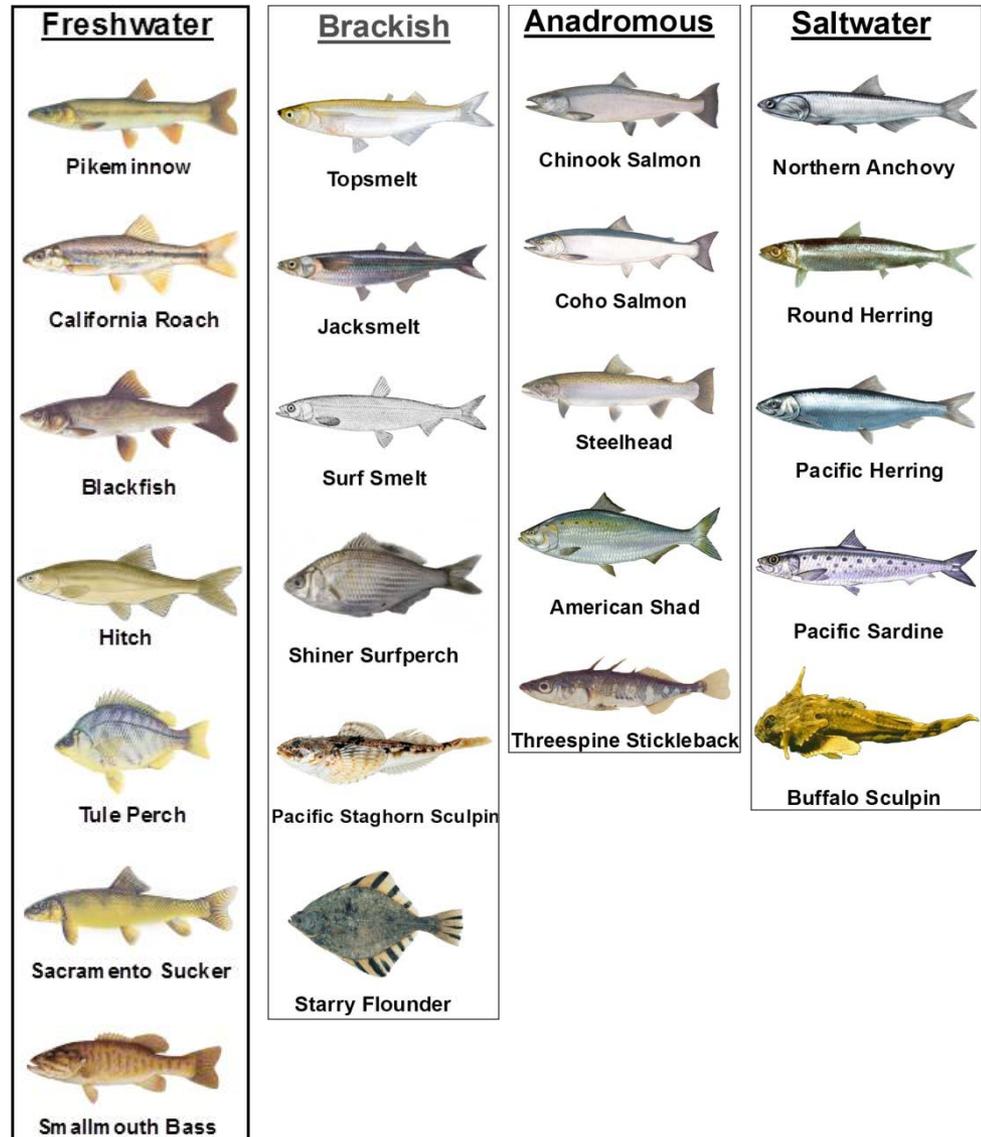
# Stream Trapping-Size/age structure

- Based on fork length most steelhead captured at Austin Creek are young-of-the-year (YOY)

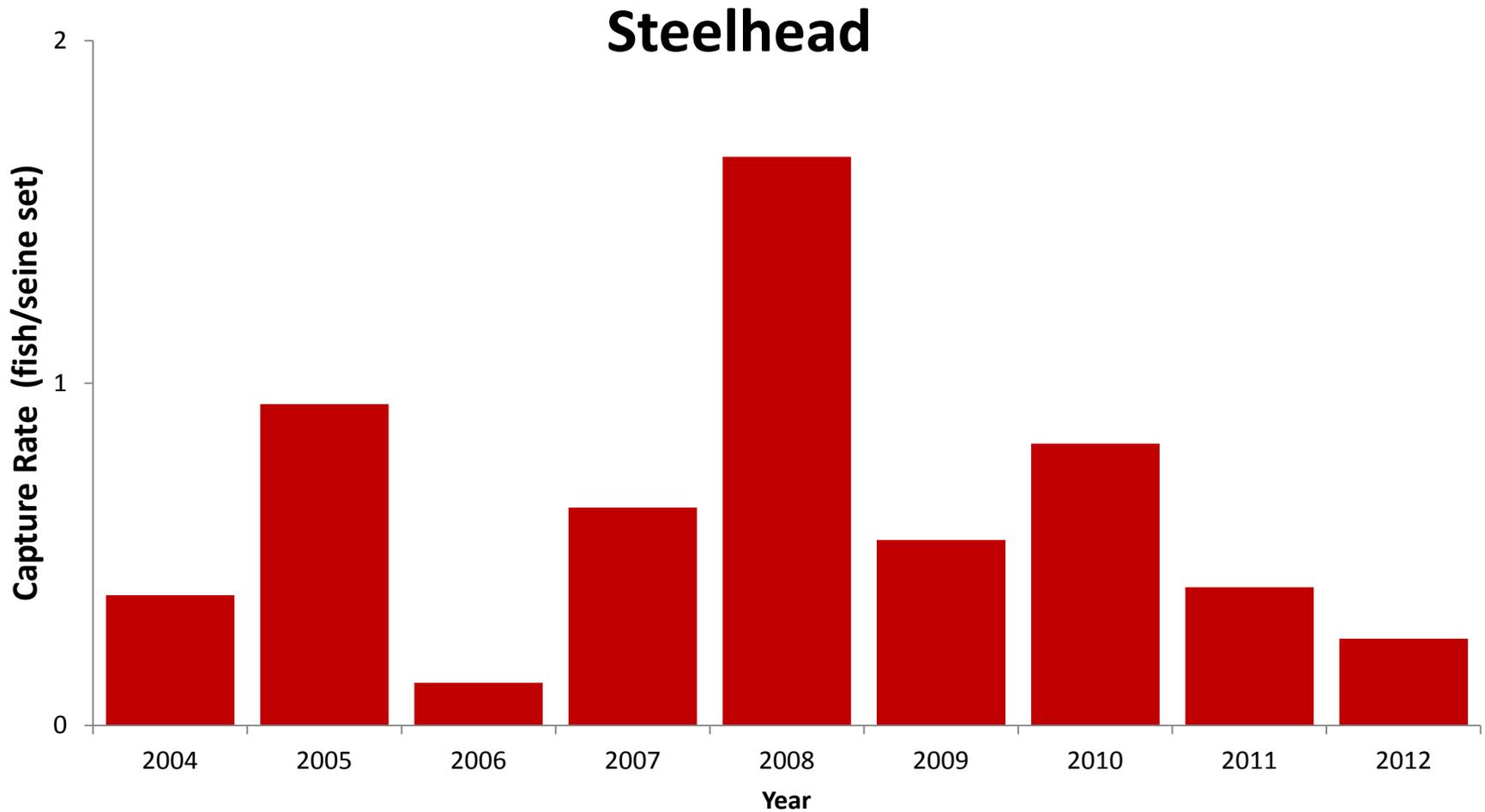


# Estuary Fish Seining

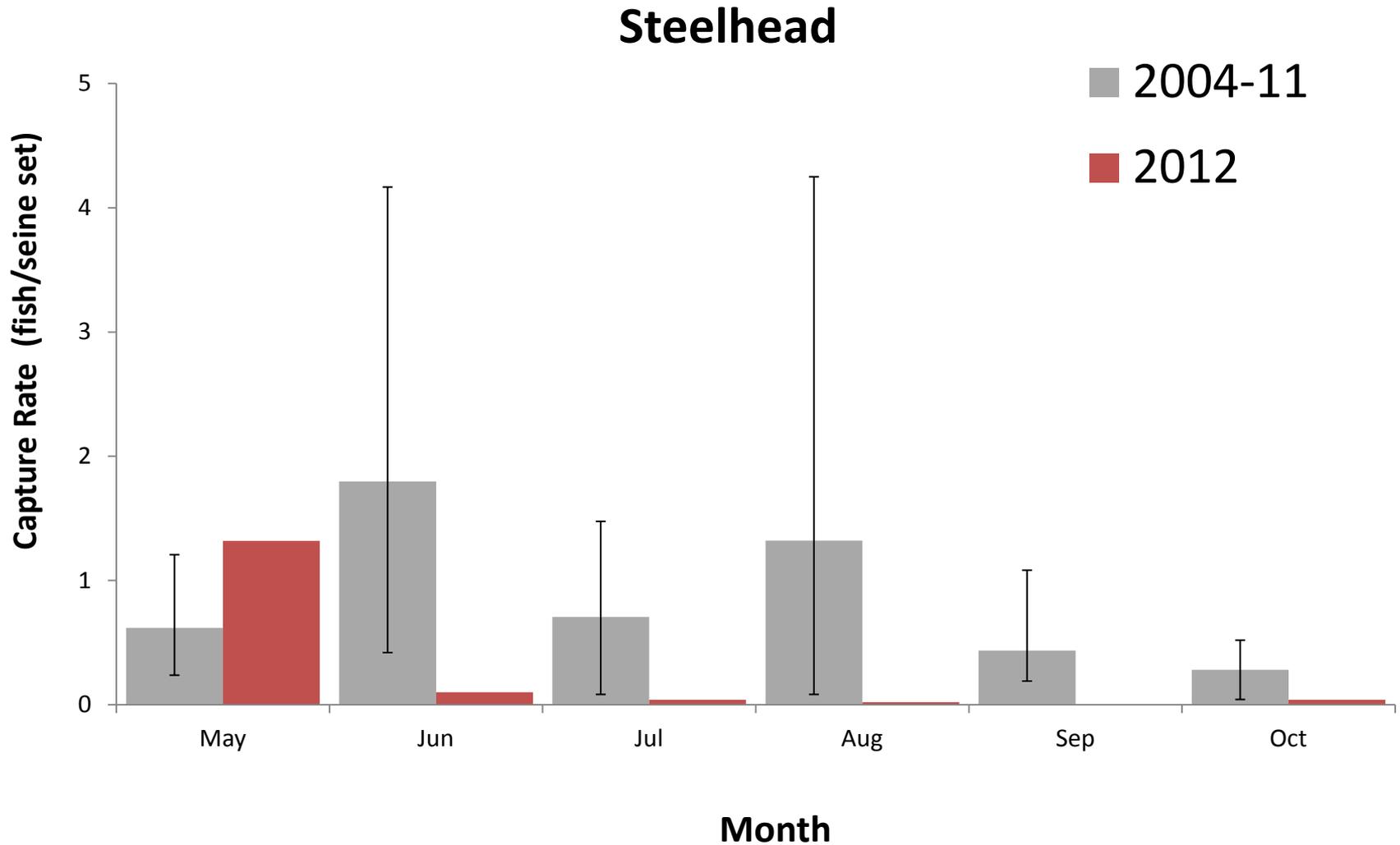
- Fish diversity and abundance
- Identified 50 fish species
- 2012 Surveys
  - 26 species
  - 23,964 fish caught
  - 89% of catch comprised of:
    - Threespined Stickleback
    - Sacramento Sucker
    - Prickly Sculpin
    - Sacramento Pikeminnow



# Estuary-Steelhead Annual Abundance



# Estuary-Steelhead Seasonal Abundance

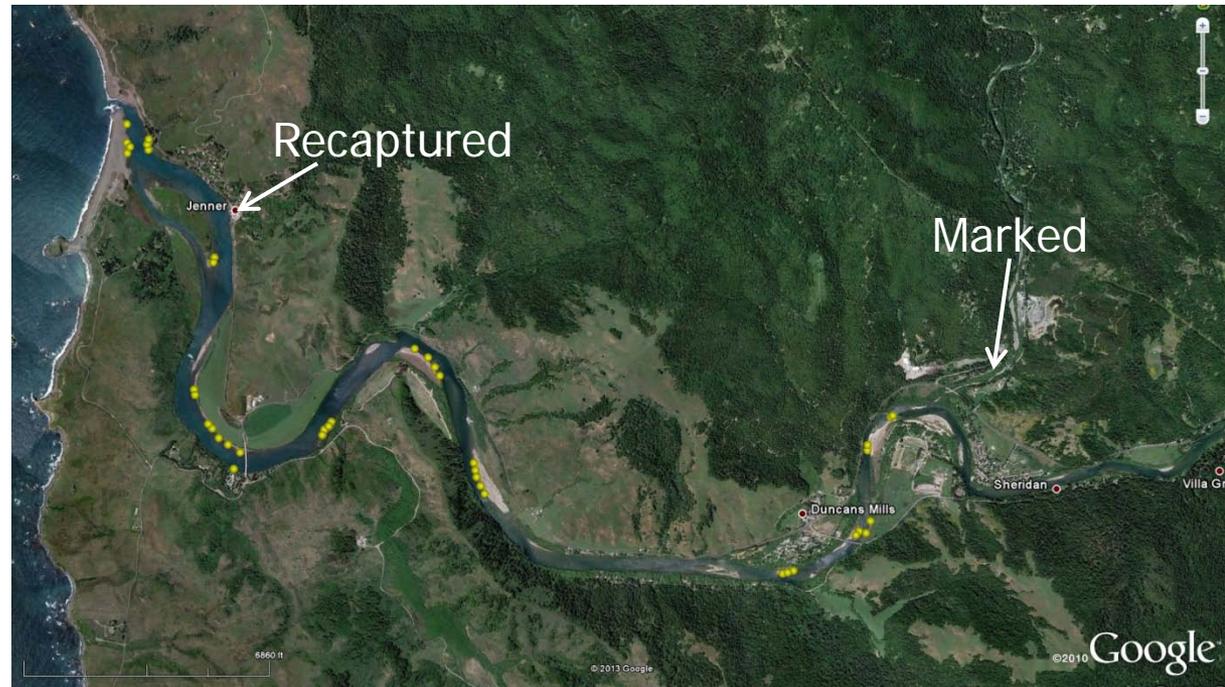


# Estuary-Steelhead Distribution

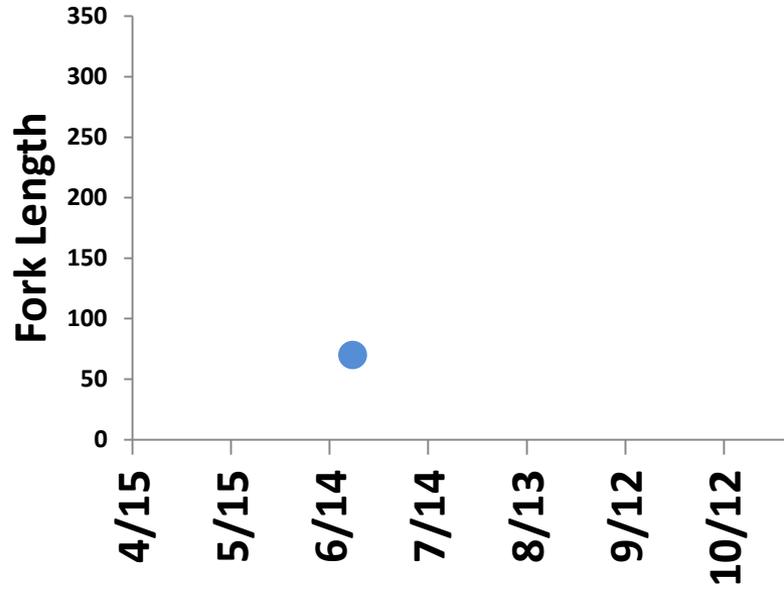


# PIT Tag Recapture Example

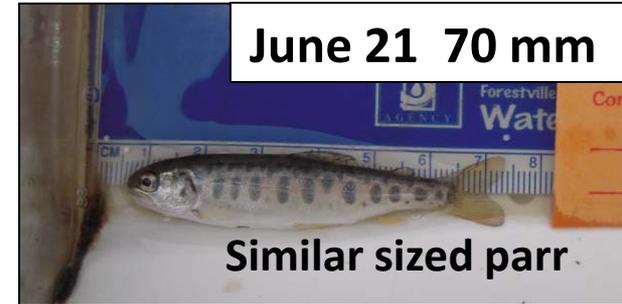
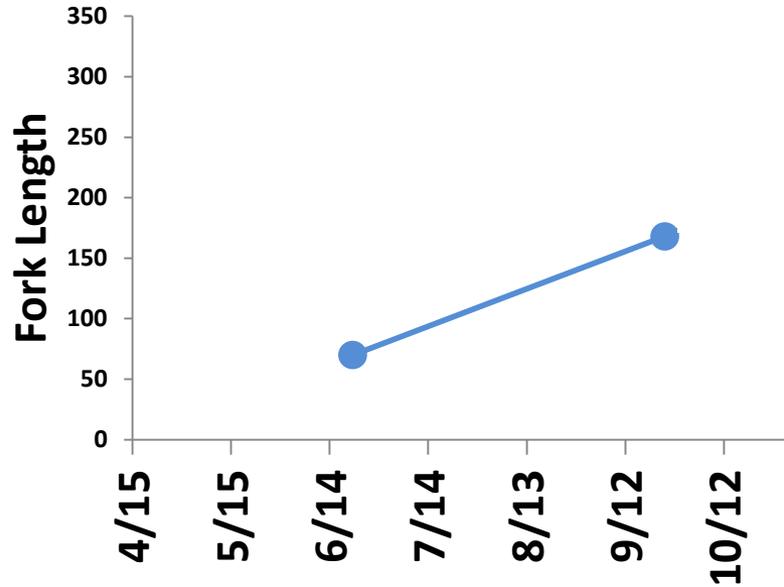
- 70 mm Steelhead parr (young-of-the-year)
- Marked: Austin Ck
- Recaptured: Jenner Gulch
  - Traveled 11.5 km from a freshwater tributary to a heavily marine influenced site



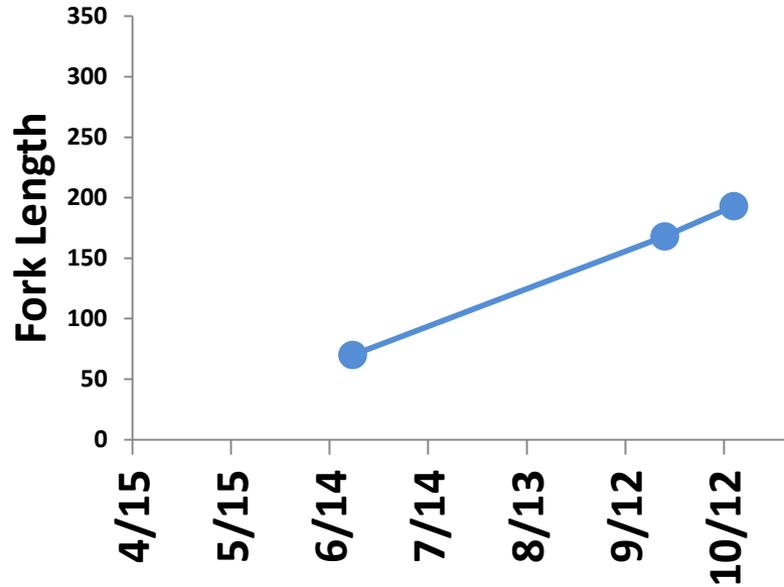
# PIT Tag Recapture Example



# PIT Tag Recapture Example



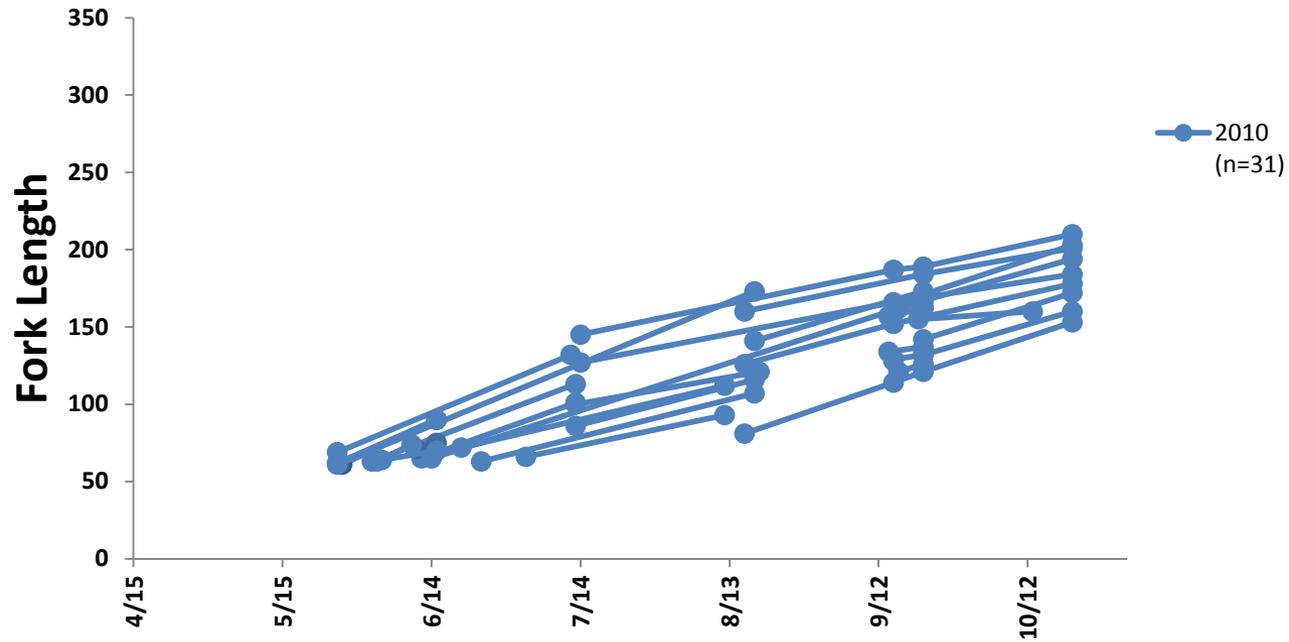
# PIT Tag Recapture Example



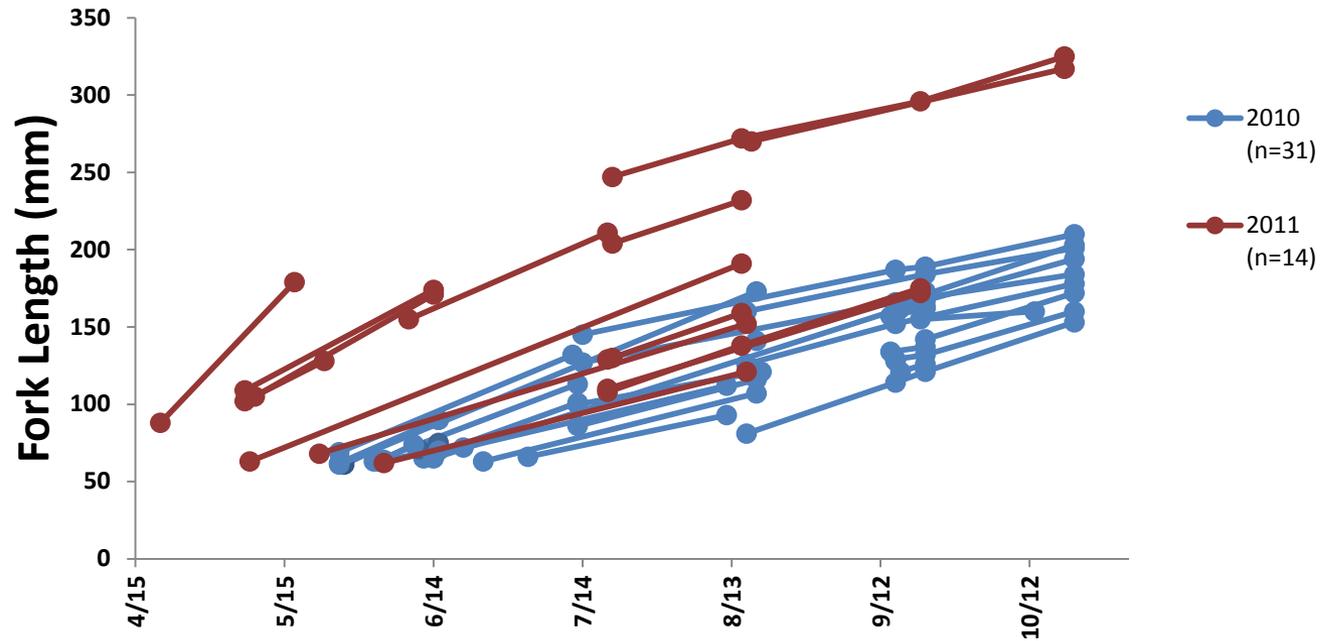
Fork Length = 70-193 mm  
Days between capture = 116  
Growth = 1.06 mm per day



# Estuary PIT Tag Recaptures-2010



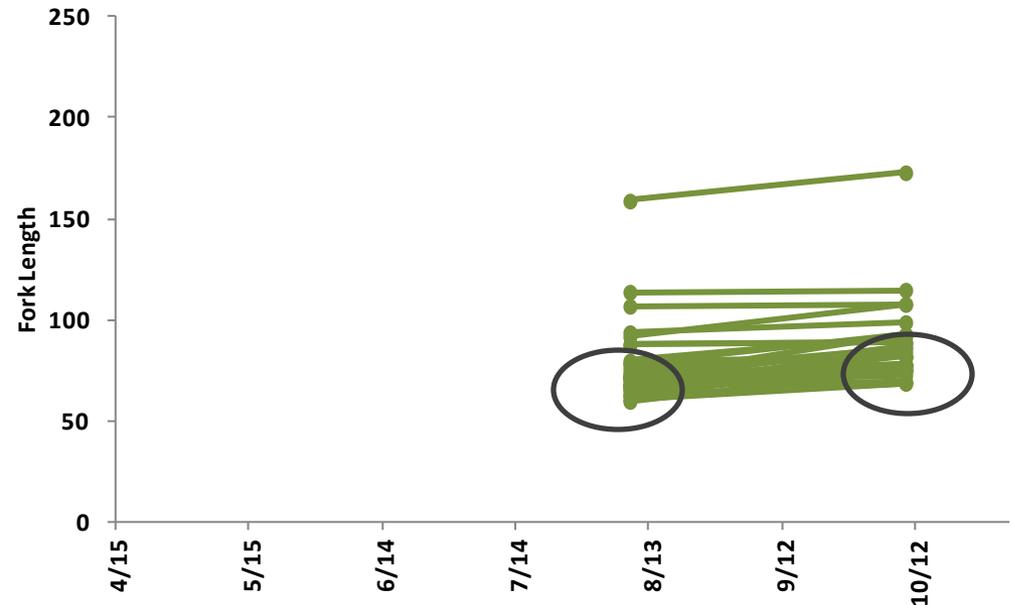
# Estuary PIT Tag Recaptures-2010-11





# Austin Creek PIT Tag Recaptures-2012

- Steelhead parr
- Tagged in Austin Creek  
Recaptured in Austin Creek
- Growth rates not as high as in estuary
  - Average growth 0.2 mm/day



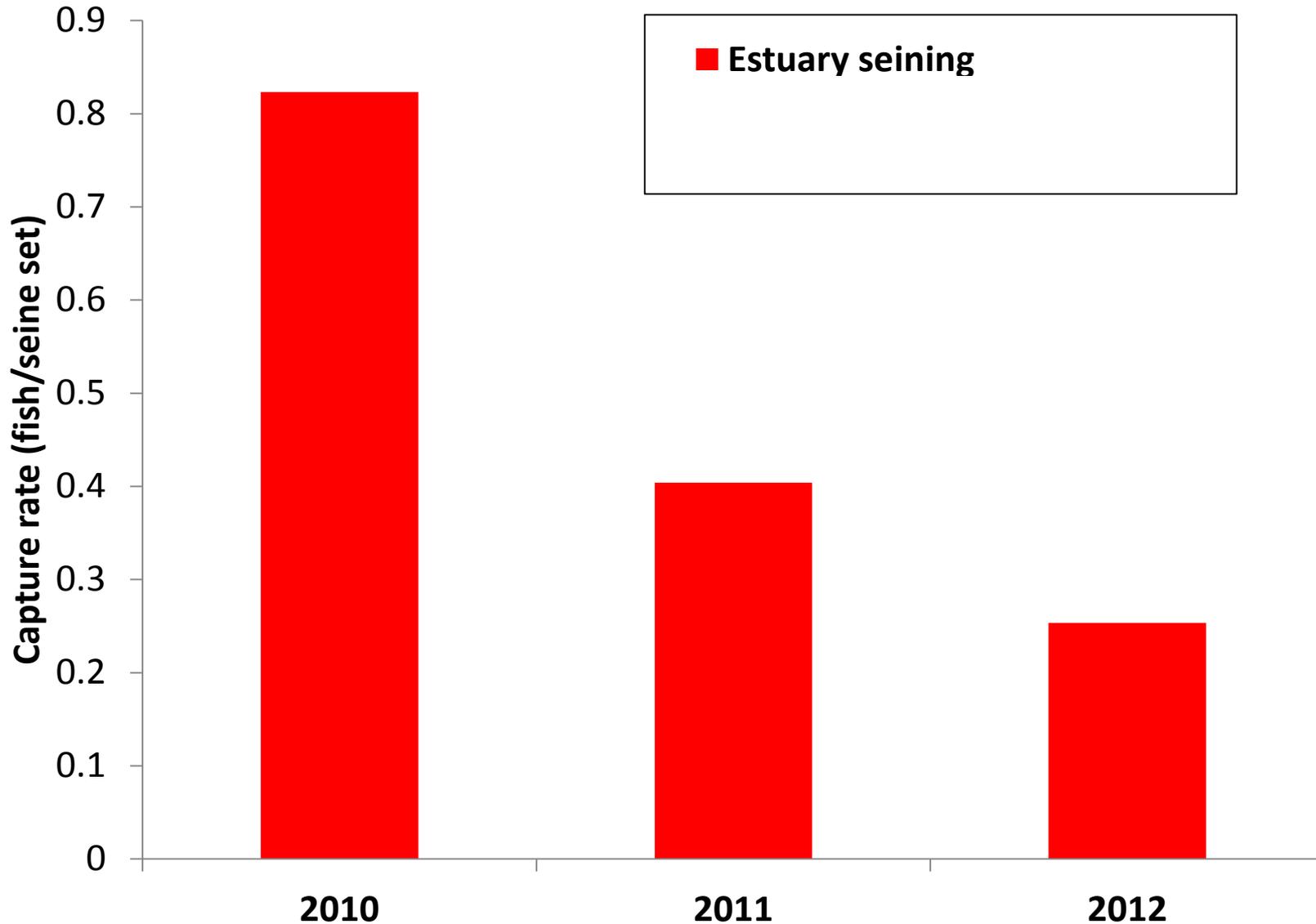
Marked



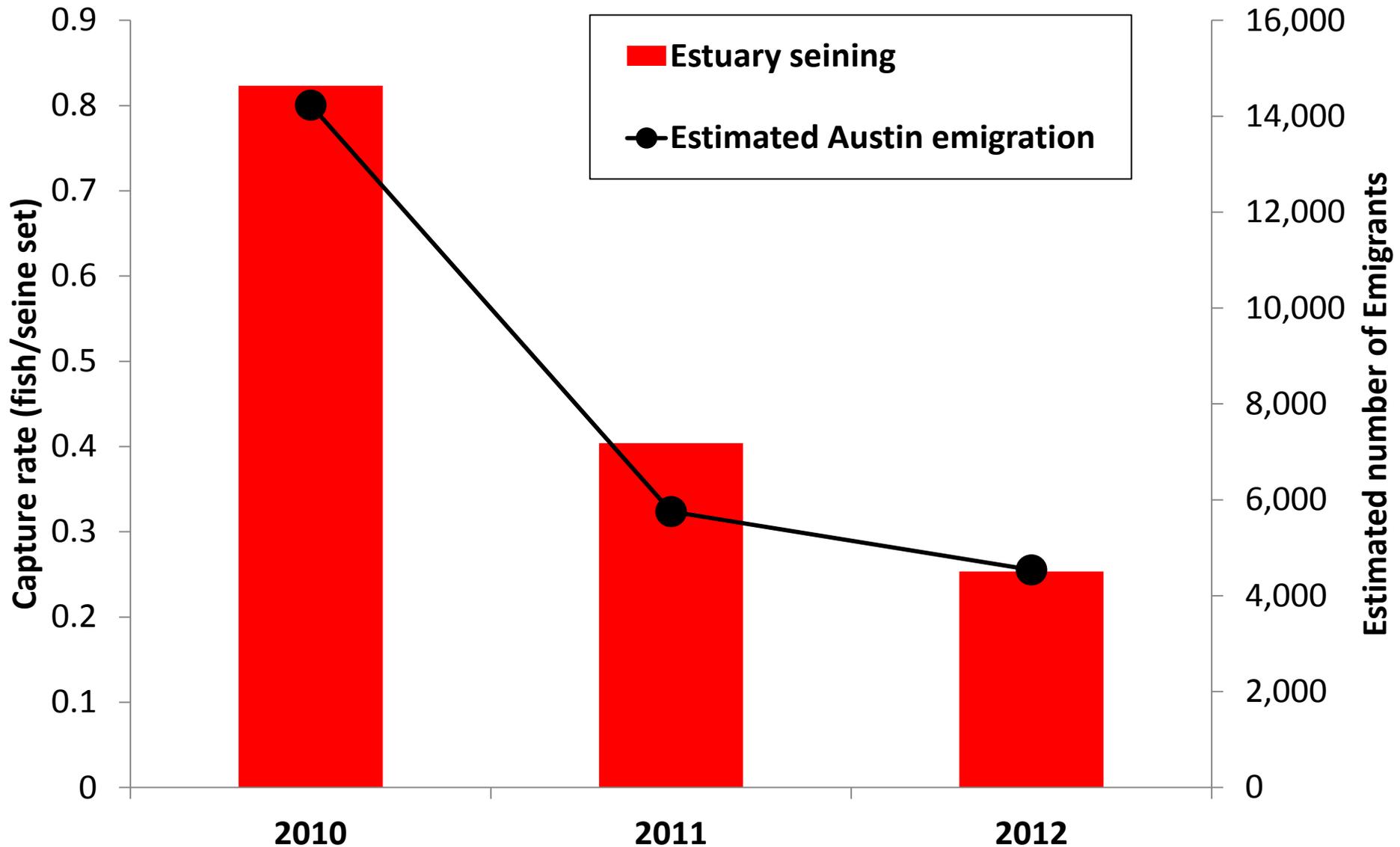
Recaptured



# Trends- *Steelhead juveniles in estuary*



# Trends- *Steelhead juveniles in estuary*



# Summary-Steelhead

## Fish entering the estuary

- Relatively large numbers of young-of-the-year steelhead leave Austin Creek during spring
- Many steelhead move quickly to the Estuary



## Fish residing in the estuary

- Extended periods of time
- Experience high growth under current estuary conditions



# Summary-*Steelhead*

- Limited opportunity for comparison of habitat use between tidal and lagoon conditions.
- Little is known about returning adult steelhead that reared as juveniles in the Russian River estuary



# Expanding Study Efforts

- PIT Antenna
- Seining Station



