

# Juvenile Salmonid Emigration Monitoring in the Middle Sacramento River

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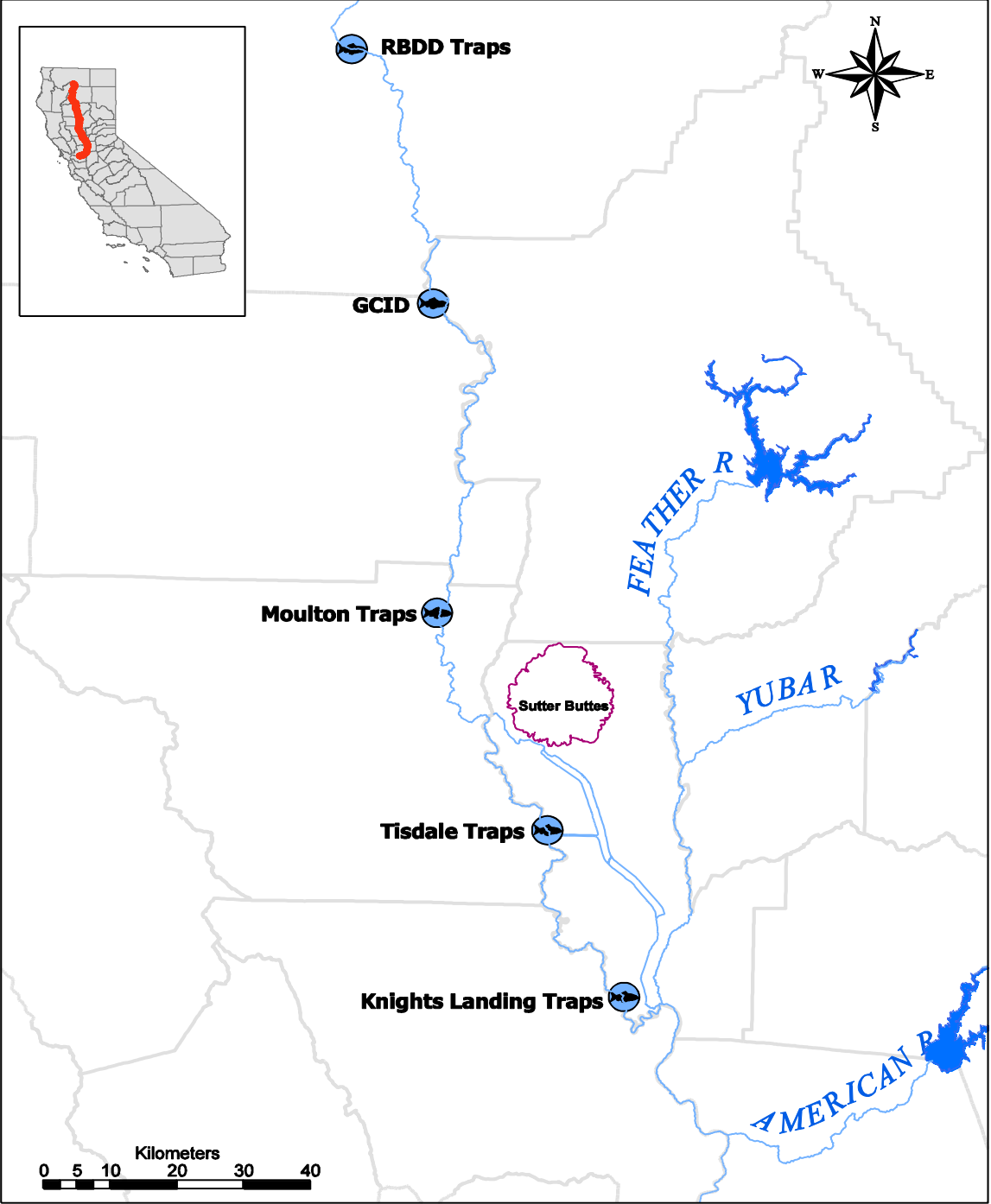


Monitoring is conducted primarily to develop information on emigration timing and race of juvenile Chinook salmon and steelhead trout.

The National Marine Fisheries Service Operations Criteria and Procedures Biological Opinion states *“Sacramento River new juvenile monitoring station: The exact location to be determined, between RBDD and Knights Landing, in order to give early warning of fish movement and determine survival of listed fish species leaving spawning habitat in the upper Sacramento River.”*

### Objectives:

- Provide data on juvenile salmonid downstream movement patterns to create greater flexibility in water management by providing advanced notice of emigrating salmonids moving to the Delta. Current planning efforts are focused on developing solutions to protect Delta fisheries while providing a sustainable and reliable water conveyance system. Data will assist in conflict resolution between water management operations and listed species.
- Enhance existing RST Monitoring sites; ability to track movement of emigrating salmonids between sites.
- Provide assurance against interruptions in emigrant data due to a failure at one of the other monitoring sites.
- Identify influences of middle Sacramento River flood relief structures on downstream movement of salmonids.
- Correlate abiotic factors with fish movement patterns.



# Tisdale Weir RST's



- Two 8' RST's at River Mile 159 on RL w/ river and shore anchor
- Installed 7/7/10 and fished since installation
- Upstream of Tisdale Weir but downstream of Moulton and Colusa Weirs
  - Max CFS for the Sac is 66K
- Location was selected to evaluate the weirs affects on fish abundance etc.
  - Assess timing and relative abundance
  - Moulton and Colusa Weirs using Tisdale
  - KL data can be used to evaluate Tisdale Weir (spills most frequently)



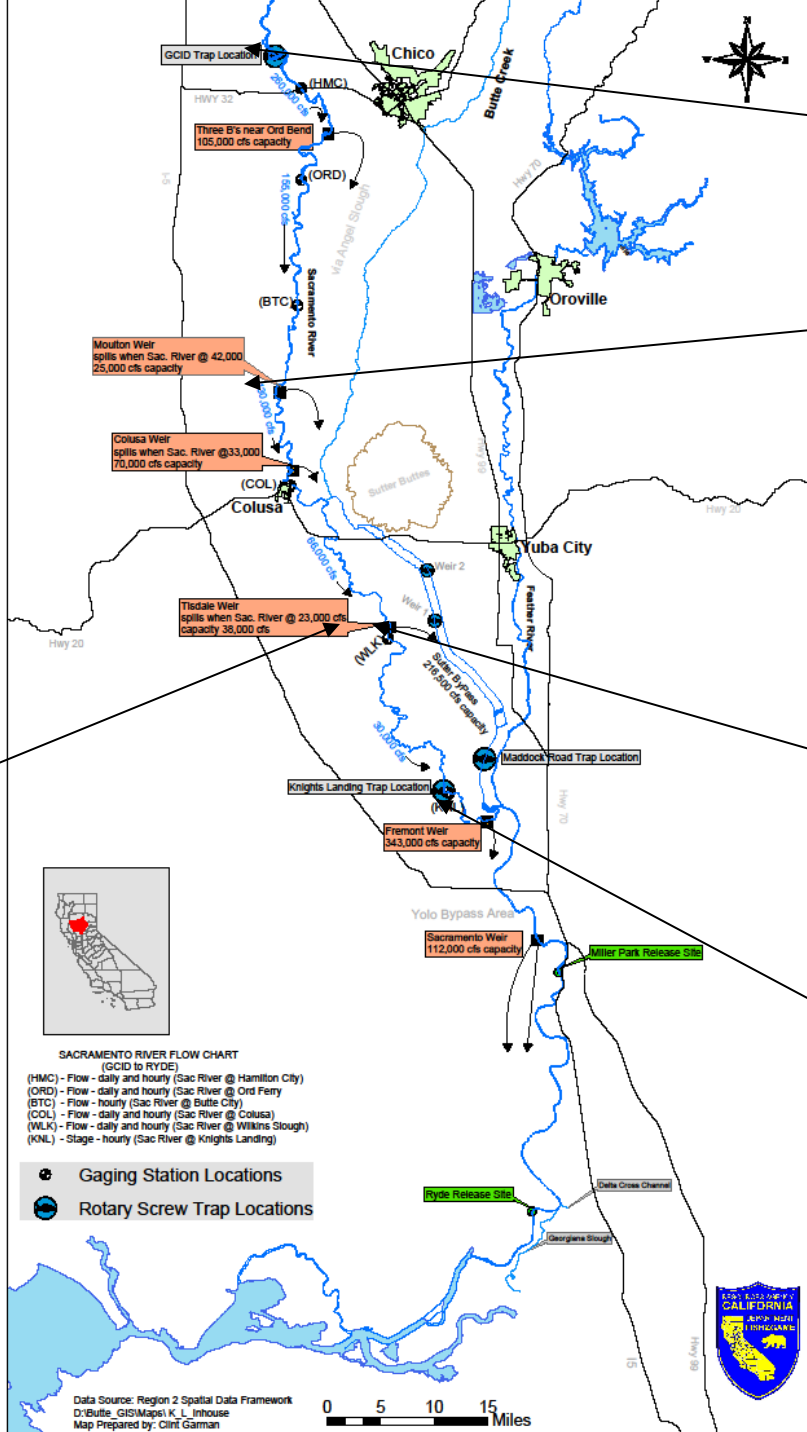
# Moulton Weir RST's

- Two 8' RST's at River Mile 120 on RR w/river and shore anchor
- Installed 7/9/10 and continuously fished through 3/19/10
- Unique in that it is only sampling location in the mainstem river that all fish pass, even during high flow events. Upstream of all major flood relief structures: Tisdale, Colusa and Moulton weirs. All weirs drain into the Sutter bypass.
- Has the greatest range and fluctuation in flows.





Tisdale Weir RST location (2 x 8' cone)

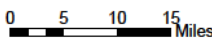


- RBDD (RM 243)
- GCID (RM 205)
- Moulton Weir \* (RM 159)
- Tisdale Weir (RM 120)
- Knights Landing (RM 88)

**SACRAMENTO RIVER FLOW CHART**  
(GCID to RYDE)

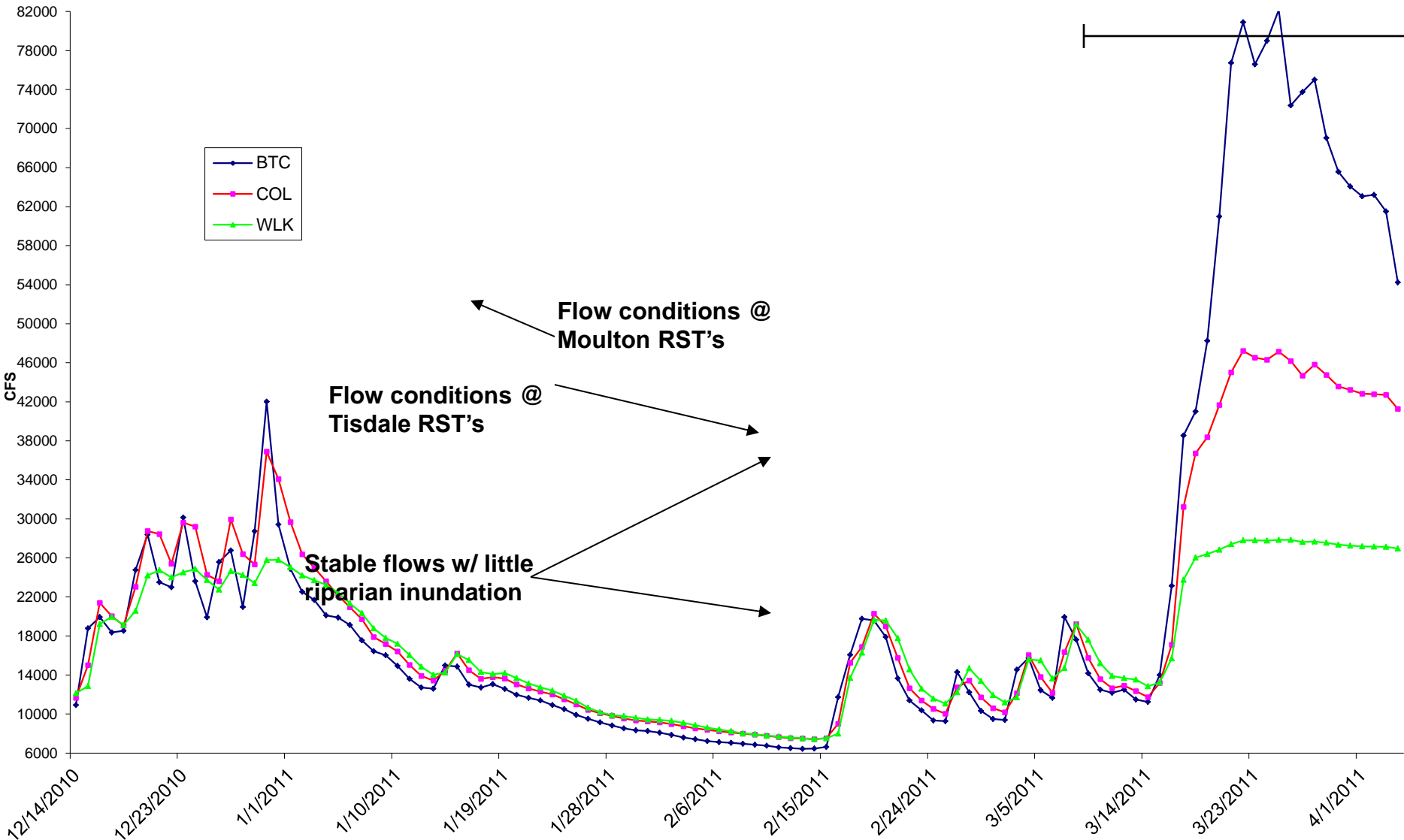
- (HMC) - Flow - daily and hourly (Sac River @ Hamilton City)
- (ORD) - Flow - daily and hourly (Sac River @ Old Ferry)
- (BTC) - Flow - hourly (Sac River @ Butte City)
- (COL) - Flow - daily and hourly (Sac River @ Colusa)
- (WLK) - Flow - daily and hourly (Sac River @ Wilkins Slough)
- (KNL) - Stage - hourly (Sac River @ Knights Landing)

- Gaging Station Locations
- Rotary Screw Trap Locations

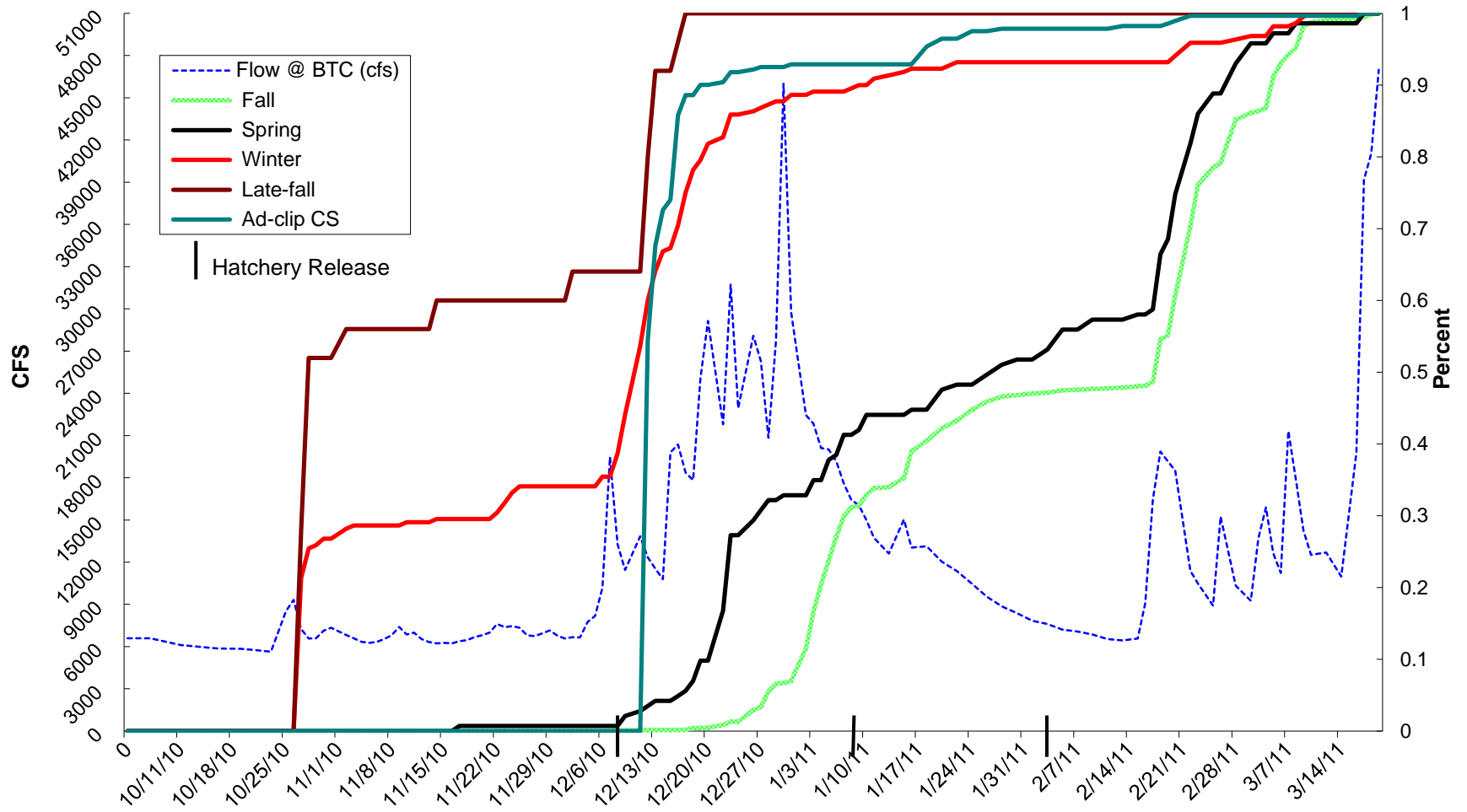


# Sacramento River Hydrograph

Mean Daily Flows on the Sacramento River at Butte City (BTC), Colusa (COL), and below Wilkins Slough (WLK)

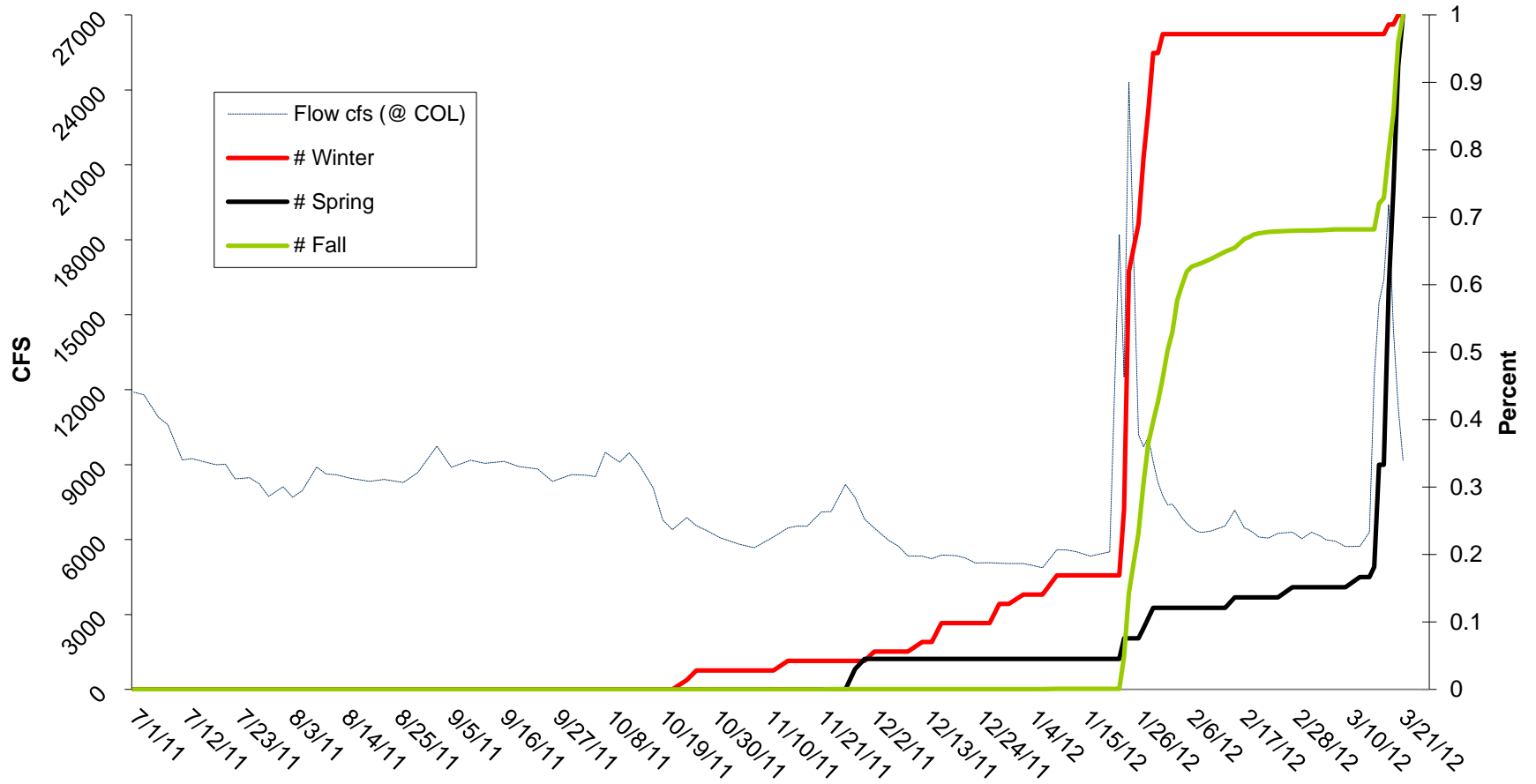


# Flow (cfs) and Cumulative Percent Distribution of Catch

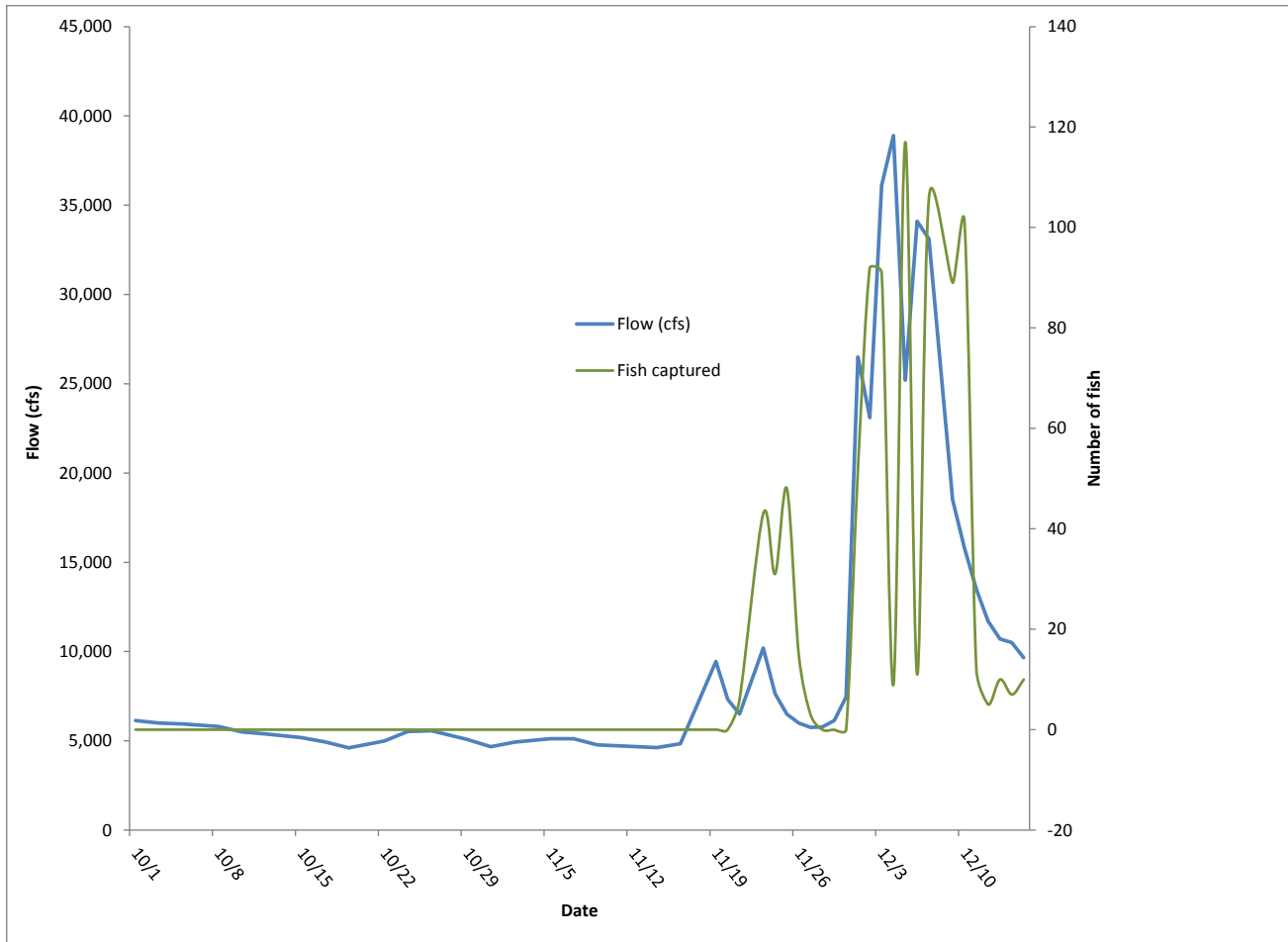




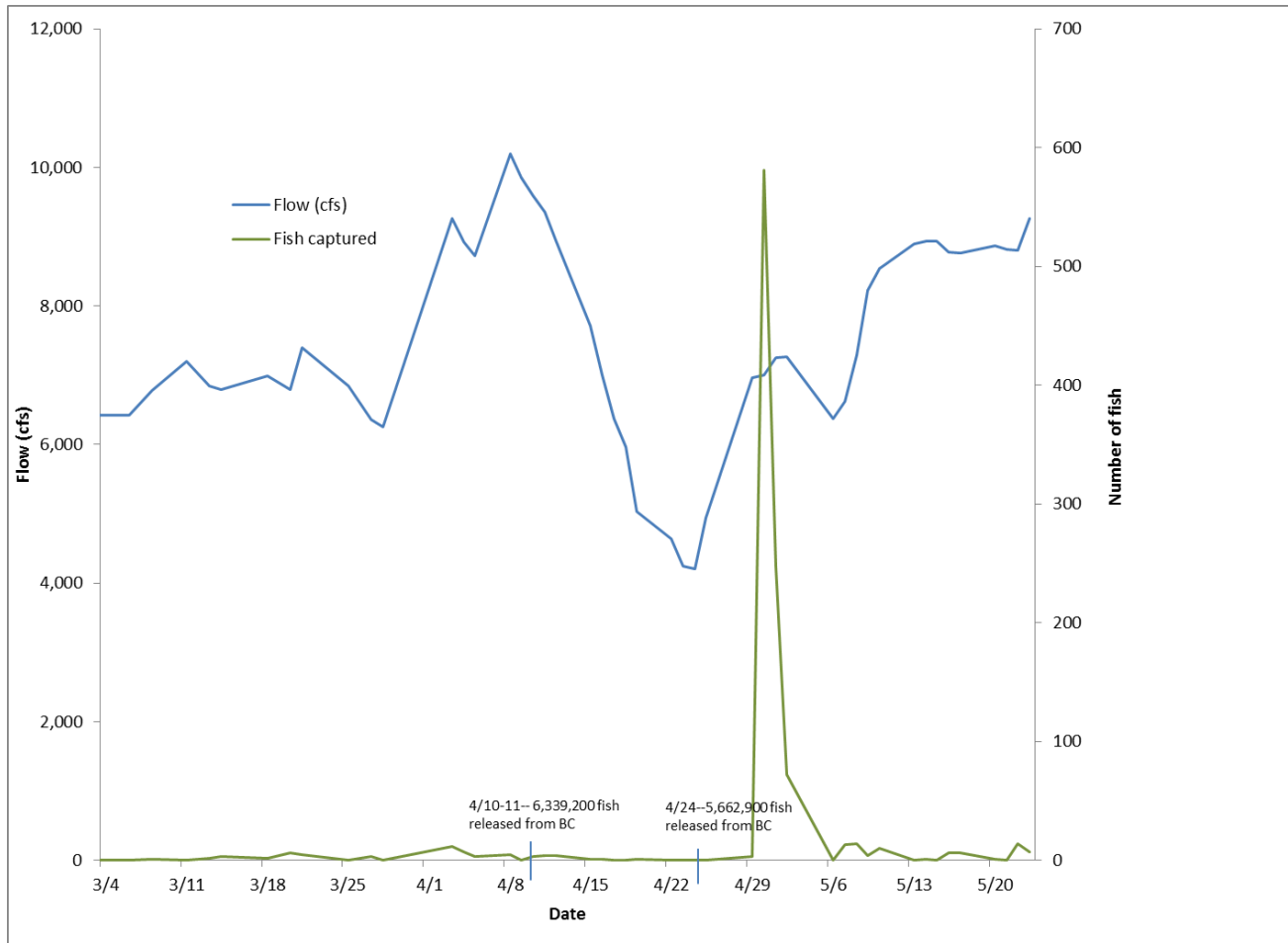
# Flow (cfs) and Relative Percent Distribution of Catch



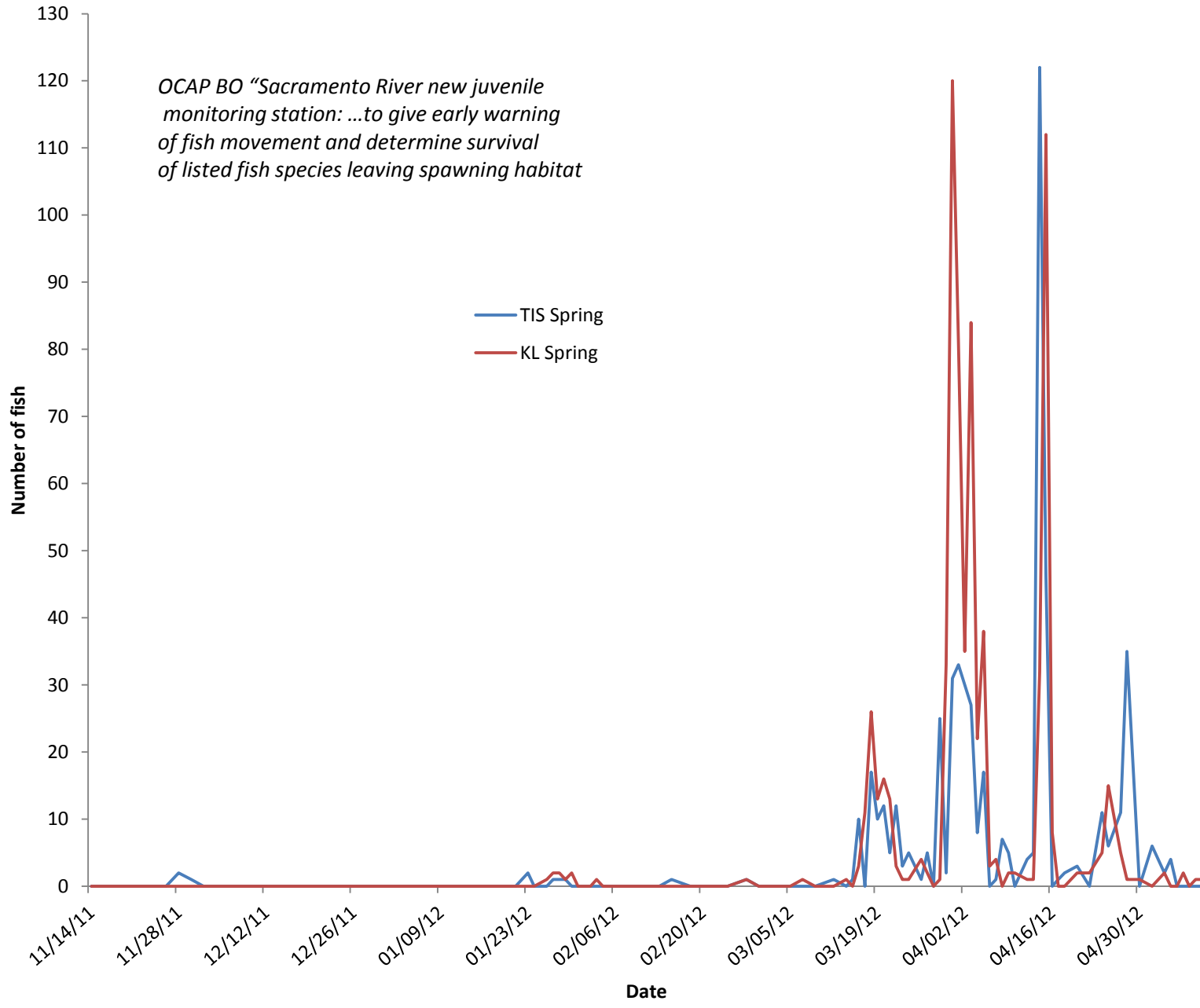
# Comparison of salmon catch to flow 10/1/12 - 12/15/12

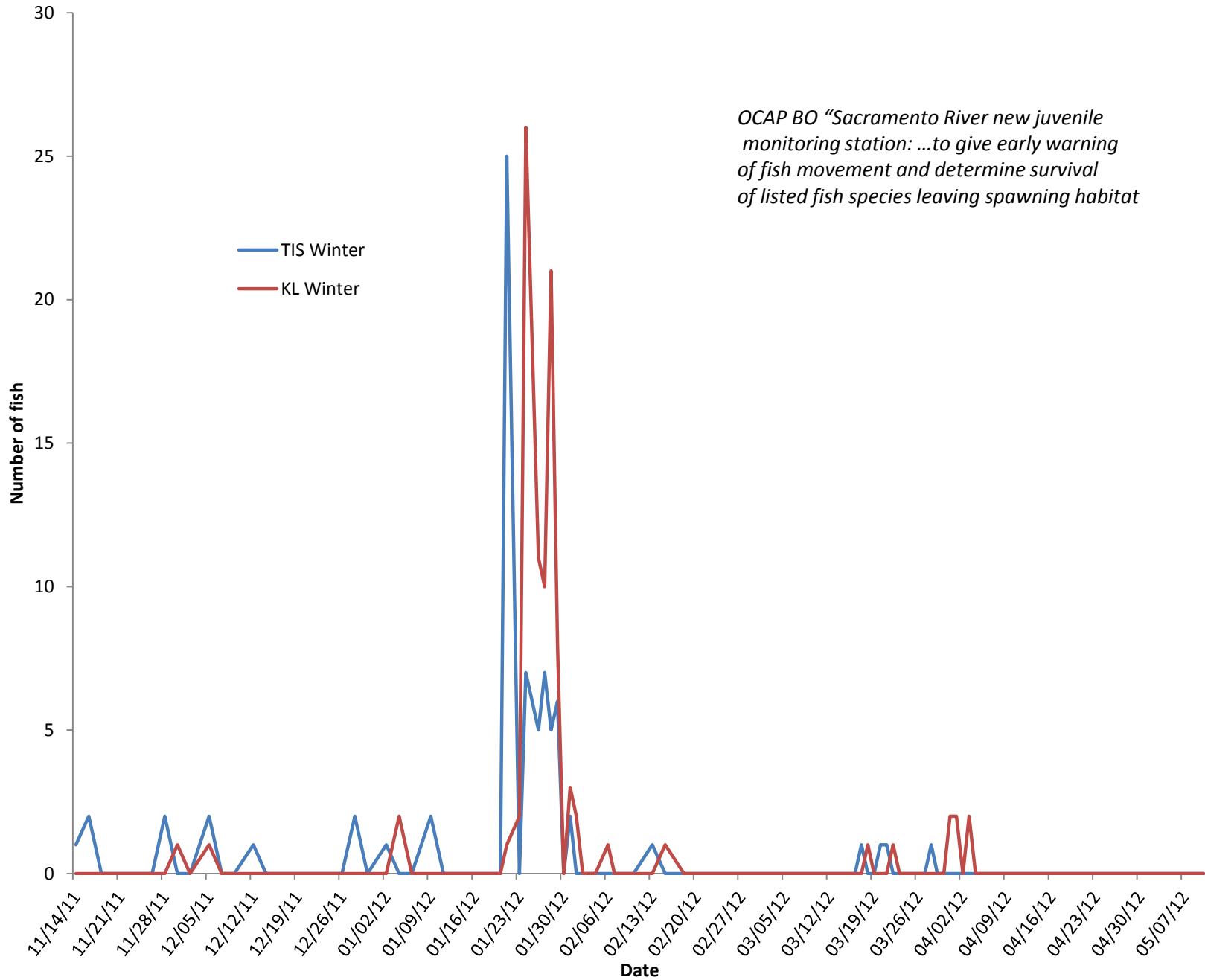


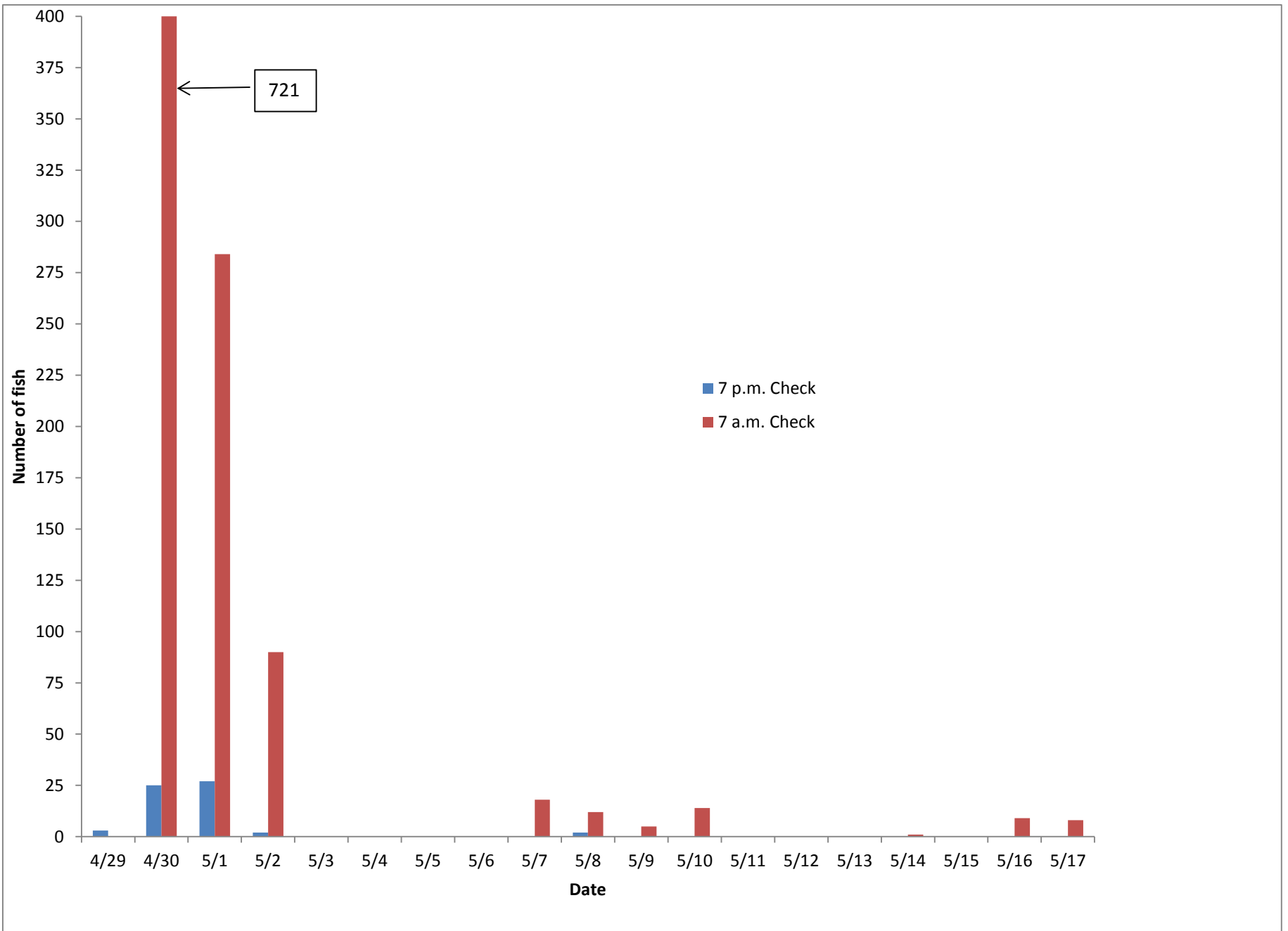
# Comparison of salmon catch to flow 3/4/13 - 5/23/13



*OCAP BO "Sacramento River new juvenile monitoring station: ...to give early warning of fish movement and determine survival of listed fish species leaving spawning habitat*









## UPCOMING ACTIONS

- Establish trap efficiencies under different flows.
- Obtain additional data on movement of hatchery and wild fish in 24 hour period.
- Compare passage and relative abundance between Sac. River trapping sites.
- Identify and compare emigrant cues between trapping locations:
  - thermal barriers, different flow regimes, hatchery releases.
- Additional comparison of hatchery release size and trap capture.