

RECLAMATION

Managing Water in the West

OCAP RPA Action IV.2.2: Six year acoustic tag experiment



U.S. Department of the Interior
Bureau of Reclamation

Overview

- 2011 Coordination Overview
- Survival model
- 2011 Research questions
- 2012 update
- Questions



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Interagency cooperative study

- US Fish and Wildlife Service-Stockton
- California Dept. Water Resources Bay-Delta Office
- USGS- Sacramento Water Resources Division
- USGS- Columbia River Research Laboratory
- California Department of Fish and Game



- University of Washington
- San Joaquin River Group Authority
- Consultant Team (FishBio, Hanson Environmental)

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2011 Coordinated Research Program

- **Vernalis Adaptive Management Program Study**
 - Spring flow pulse augmentation (May 1-31, 2011)
 - Fall run Chinook telemetry survival investigation
- **South Delta Temporary Barriers**
 - Temporary barrier placement (after June 6, 2011)
 - Fall run Chinook and steelhead telemetry survival and behavior study



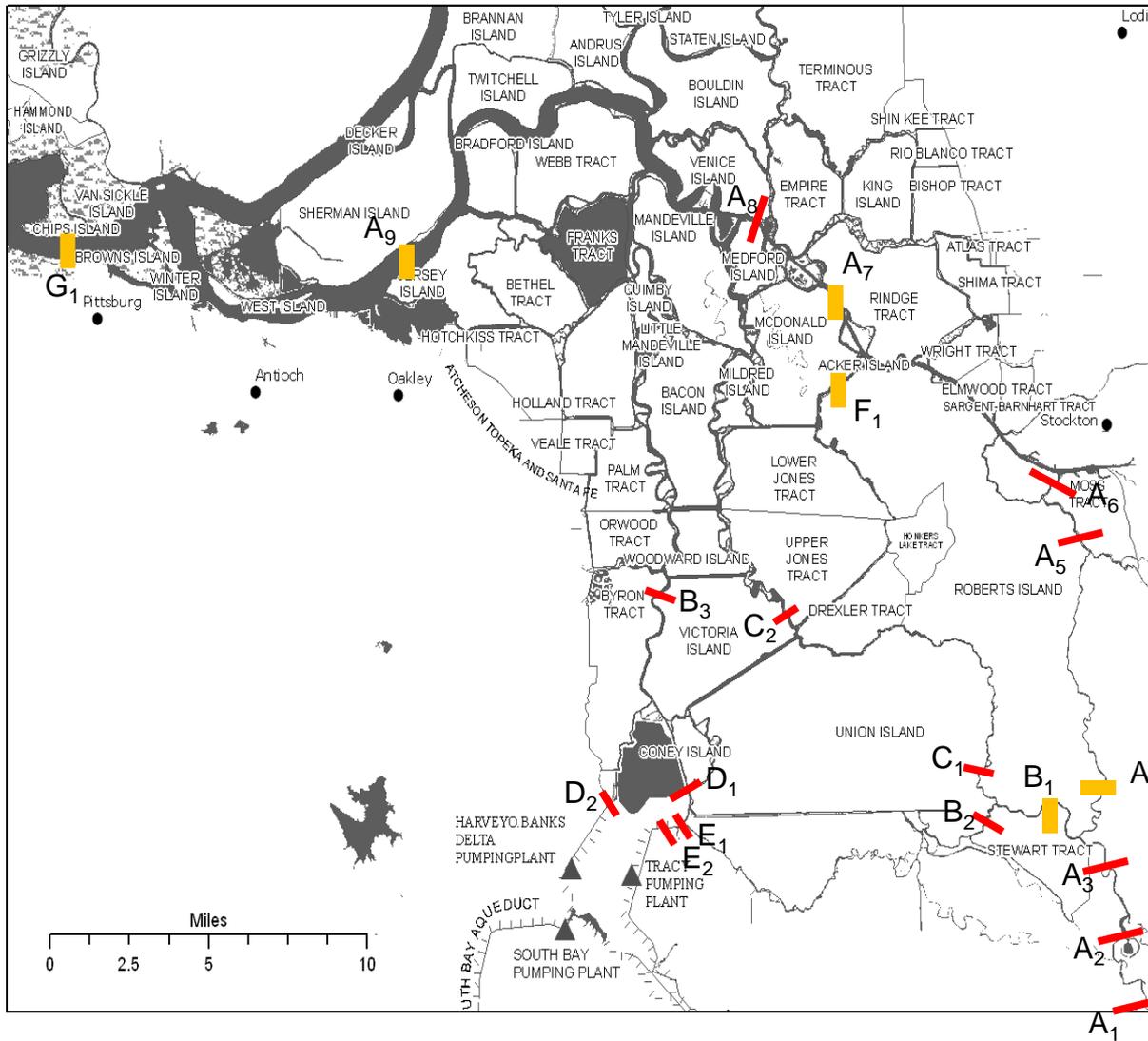
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OCAP RPA IV.2.2: Six-year acoustic tag study

- **Assessment of movement and demographics of outmigrating fish in lower San Joaquin River and Delta.**
- **3 identified periods of operations**
 - **March 1 through March 31**
 - **April 1 through May 31**
 - **June 1 through June 15**

OCAP RPA IV.2.2: Six-year acoustic tag study

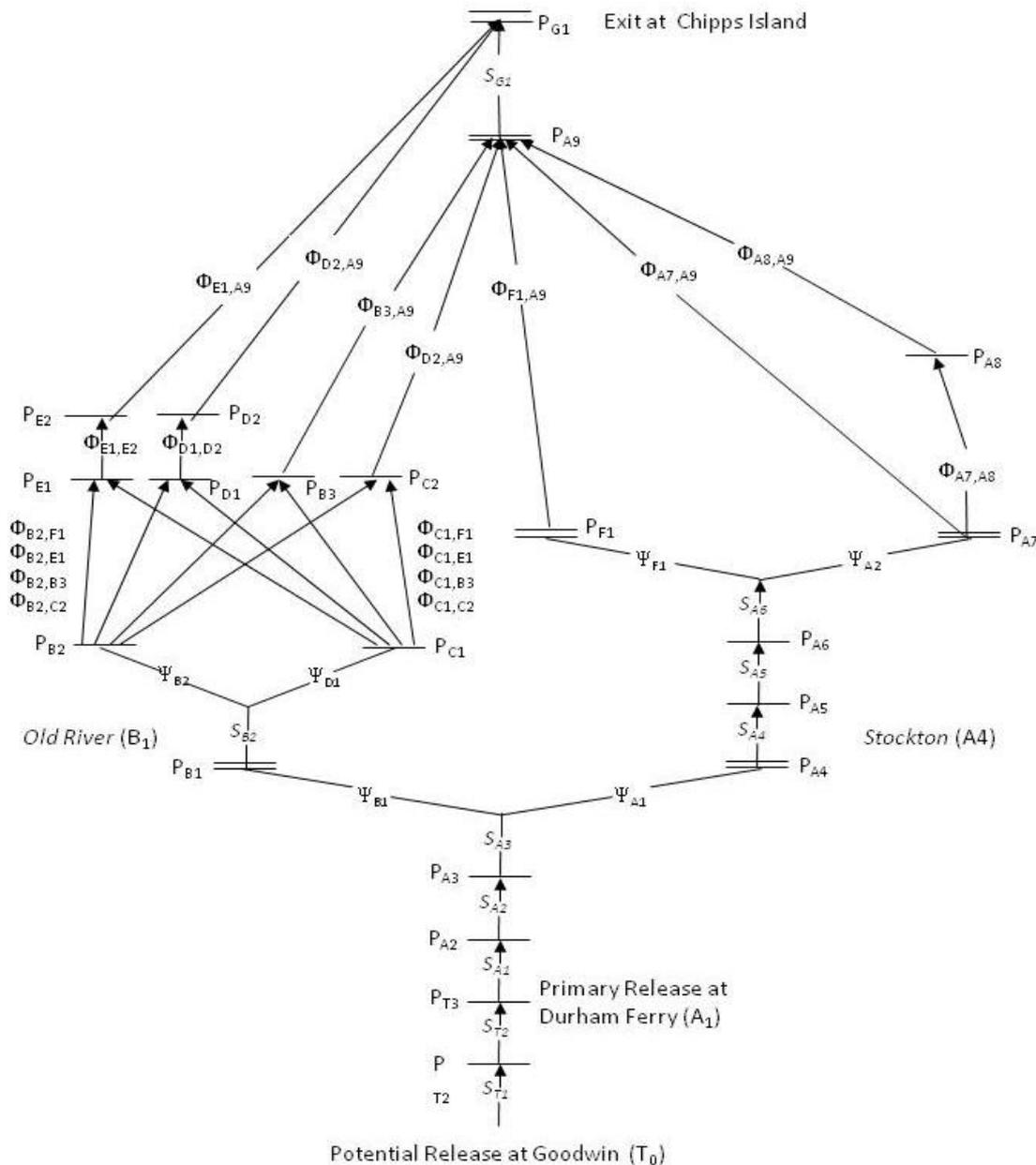
- **Survival of emigrating smolts from**
 - **tributaries into the mainstem of the San Joaquin River**
 - **mainstem San Joaquin River downstream into the Delta**
 - **Delta to Chipps Island**
- **Reach-specific mortality and/or export loss of tagged fish.**
- **Influence of flow and exports on survival and route entrainment in these migratory reaches.**
- **Test effectiveness of experimental technologies on route entrainment and selection by tagged fish.**



Dual
arrays for
increasing
detection
probability

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Survival model adapted from VAMP



Release- recapture Data

- Route selection
- Reach survival
- Overall survival

OCAP RPA IV.2.2: 2011 interagency coordination

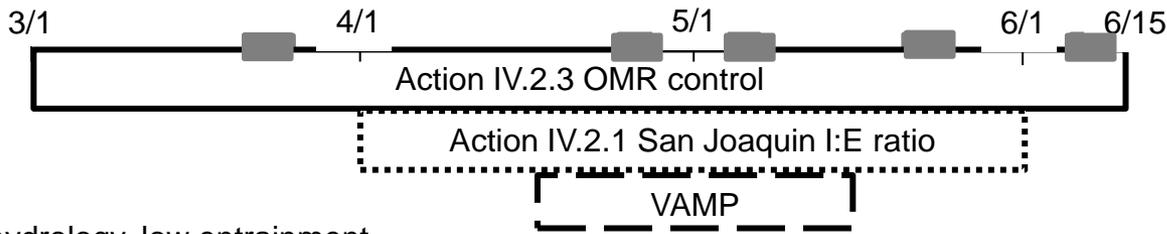
- **Study fish**
 - Mokelumne River Hatchery yearling steelhead (6YS/SDTB)
 - Merced River Hatchery Chinook smolts (VAMP/SDTB)
- **3 Tag life studies**
- **3 sets of pathology and ATPase tests**

Group	Tag	Release	VAMP Chinook release
#1	March 21-24	March 22-26	
#2	May 2-5	May 3-7	
#3	May 16-19	May 17-21	X
#4 (SDTB)	May 21-24	May 22-26	X
#5 (SDTB)	June 13-16	June 15-18	X

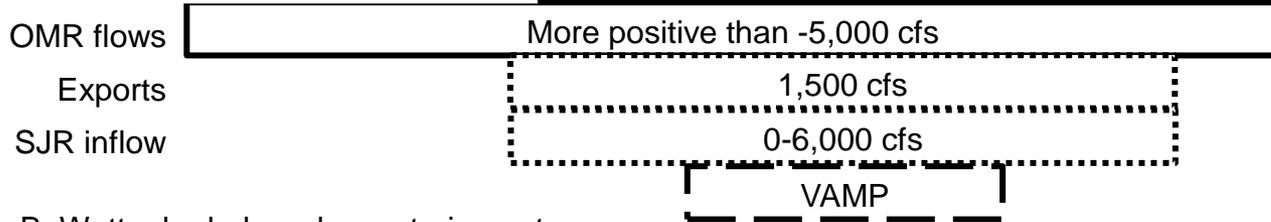
2011 Investigation

What influence do exports and flows have on emigrating steelhead smolt survival and route selection through the south Delta to Chipps Island?

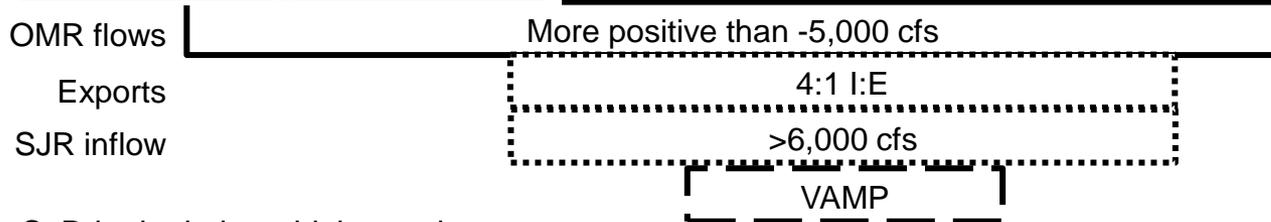
Group	Vernalis	Old River at Head	Averaged daily OMR	Total Export	Stanislaus Flows (Goodwin)
#1	23995	9613	7844	4789	1590
#2	13290	6158	3077	3369	2025
#3	10477	5091	634	4724	1865
#4	10505	5184	-609	6056	1862
#5	10510	5389	-5123	10440	1931



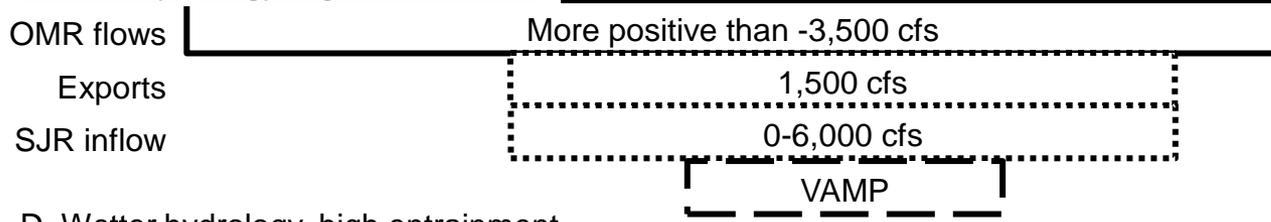
A. Drier hydrology, low entrainment



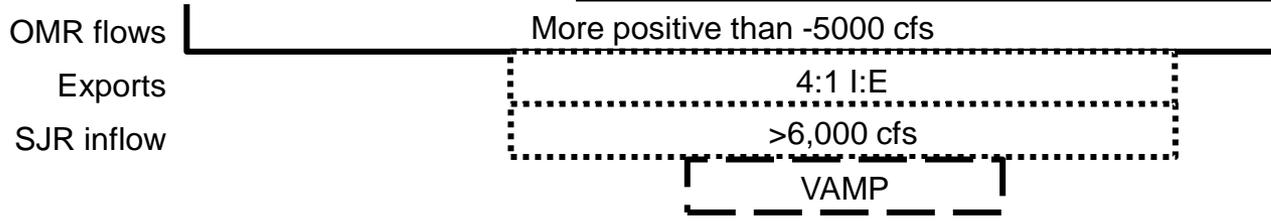
B. Wetter hydrology, low entrainment



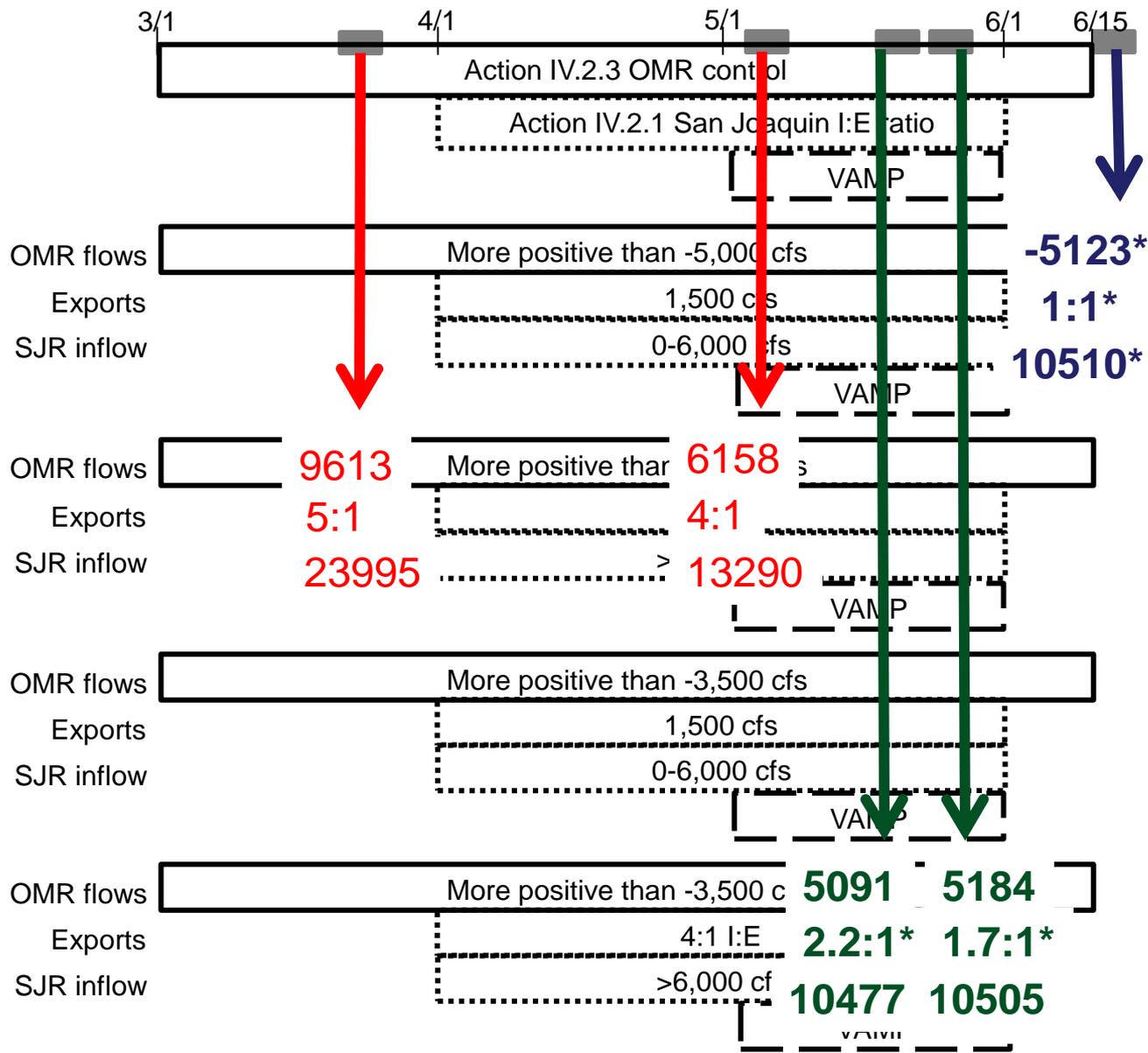
C. Drier hydrology, high entrainment



D. Wetter hydrology, high entrainment



OCAP RPA Action IV.2.2: Potential Operational Scenarios



OCAP RPA Action IV.2.2: 2011 Operational Scenarios

2011 Investigation

Are juvenile fall run Chinook salmon reasonable surrogates for juvenile steelhead?

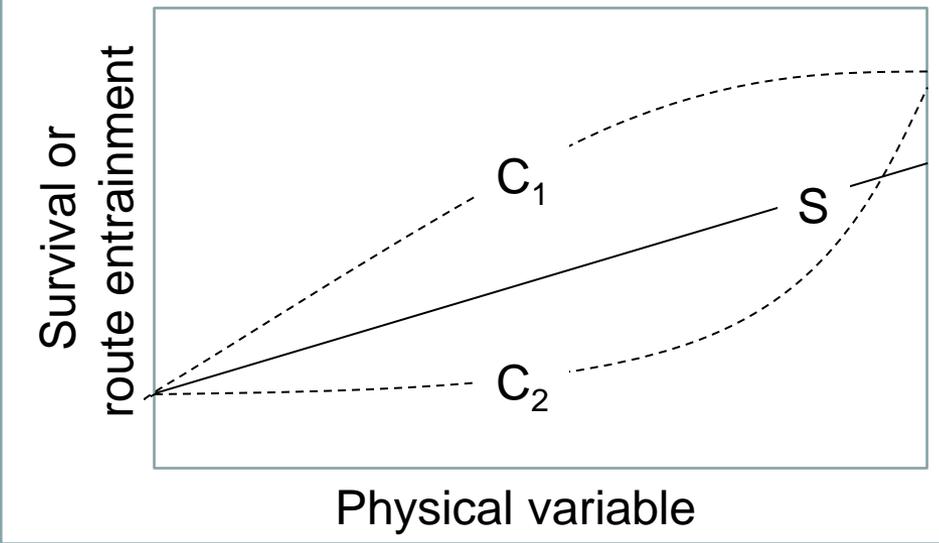
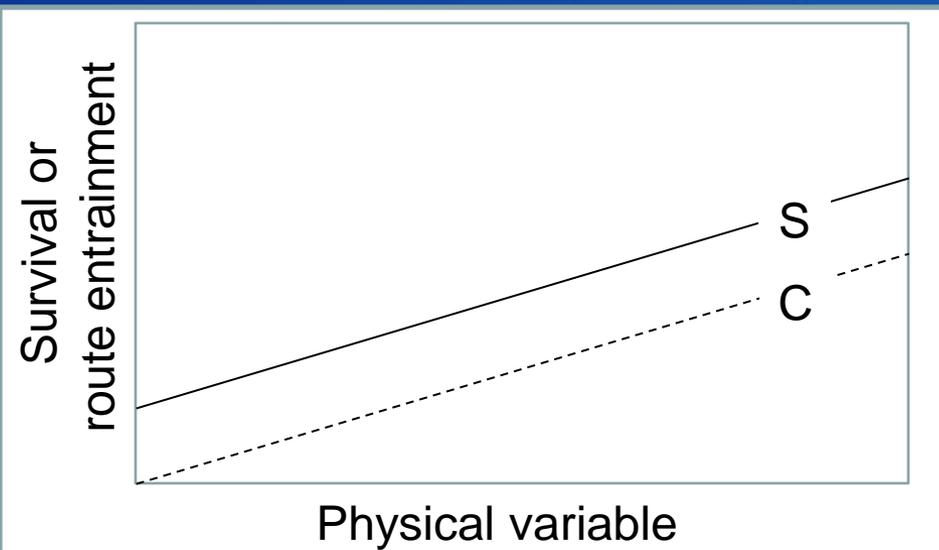
Methods:

Three identical releases of juvenile Chinook salmon and steelhead will be paired in the lower San Joaquin River during 2011.

Survival and route entrainment probabilities will be compared in common reaches of the river and Delta to examine how these variables change between species.

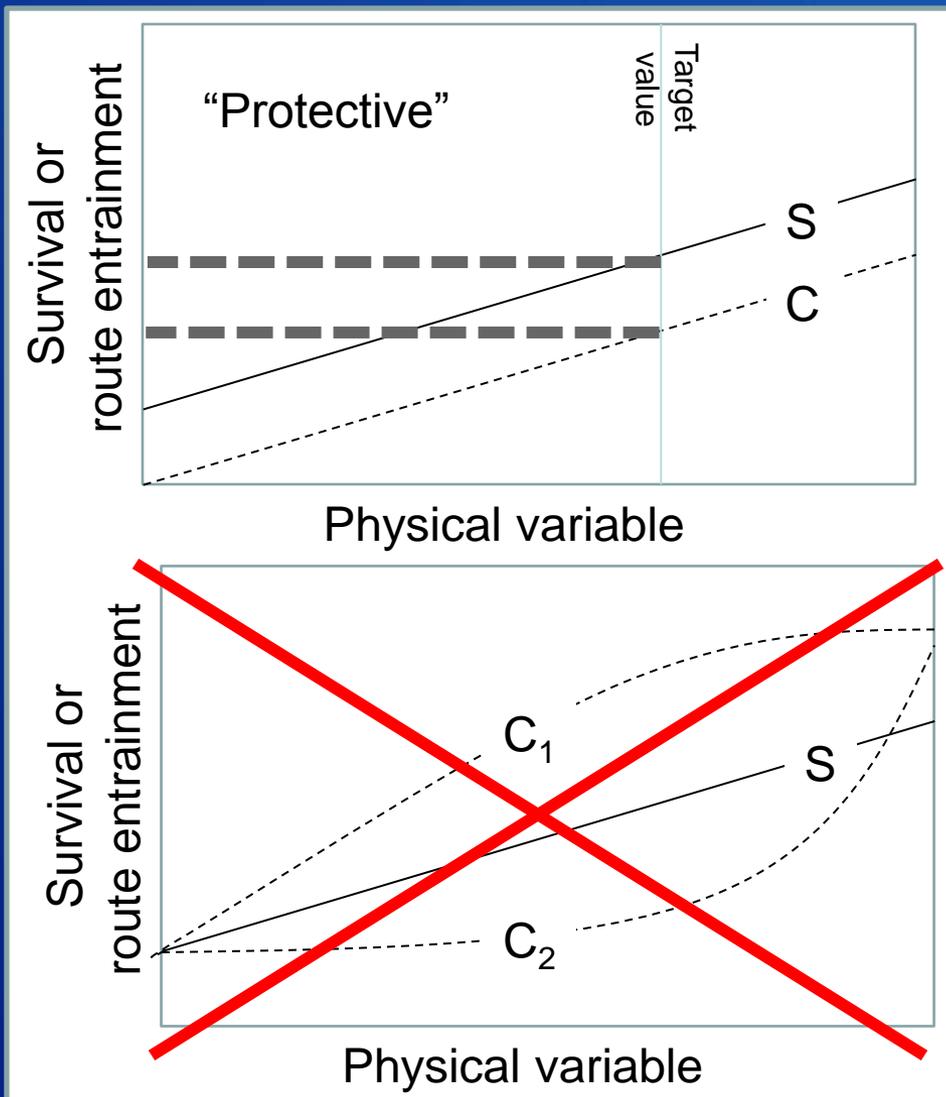


2011 Investigation: Chinook surrogacy



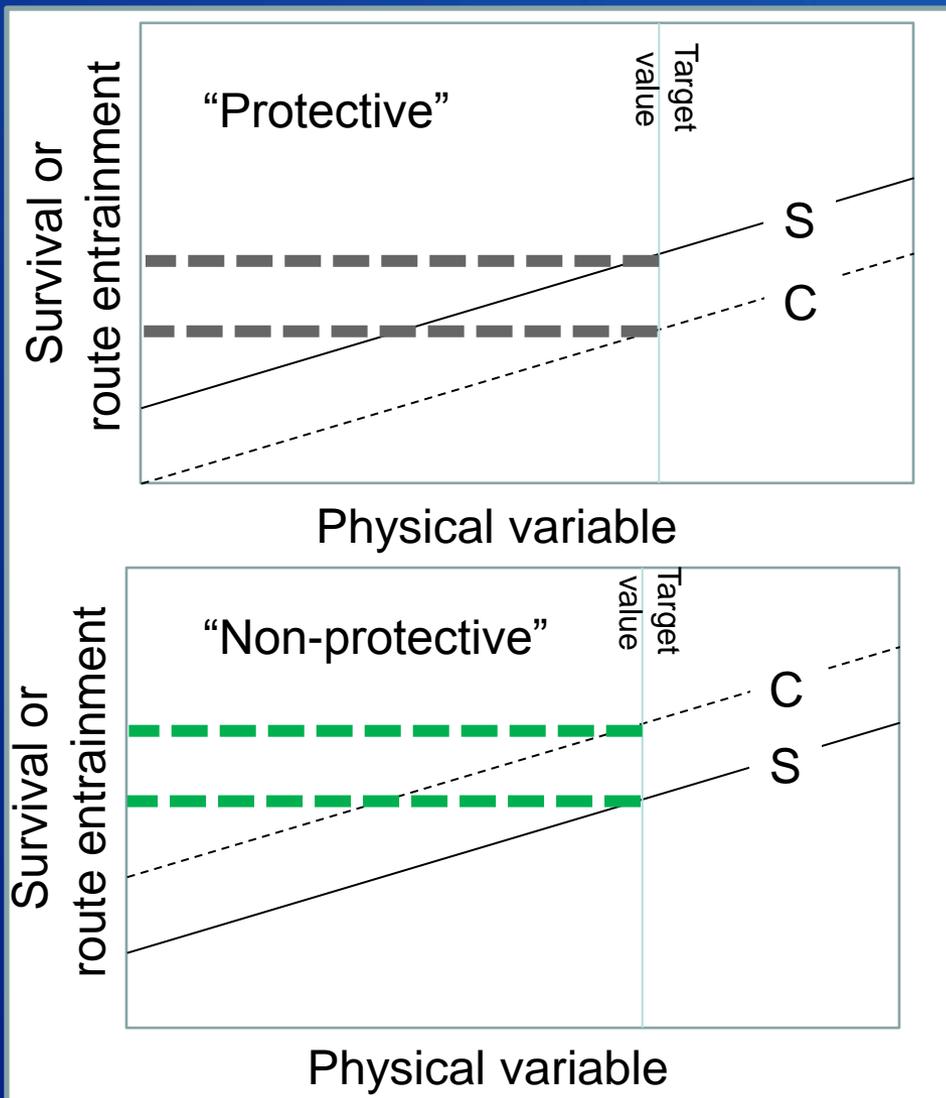
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2011 Investigation: Chinook surrogacy



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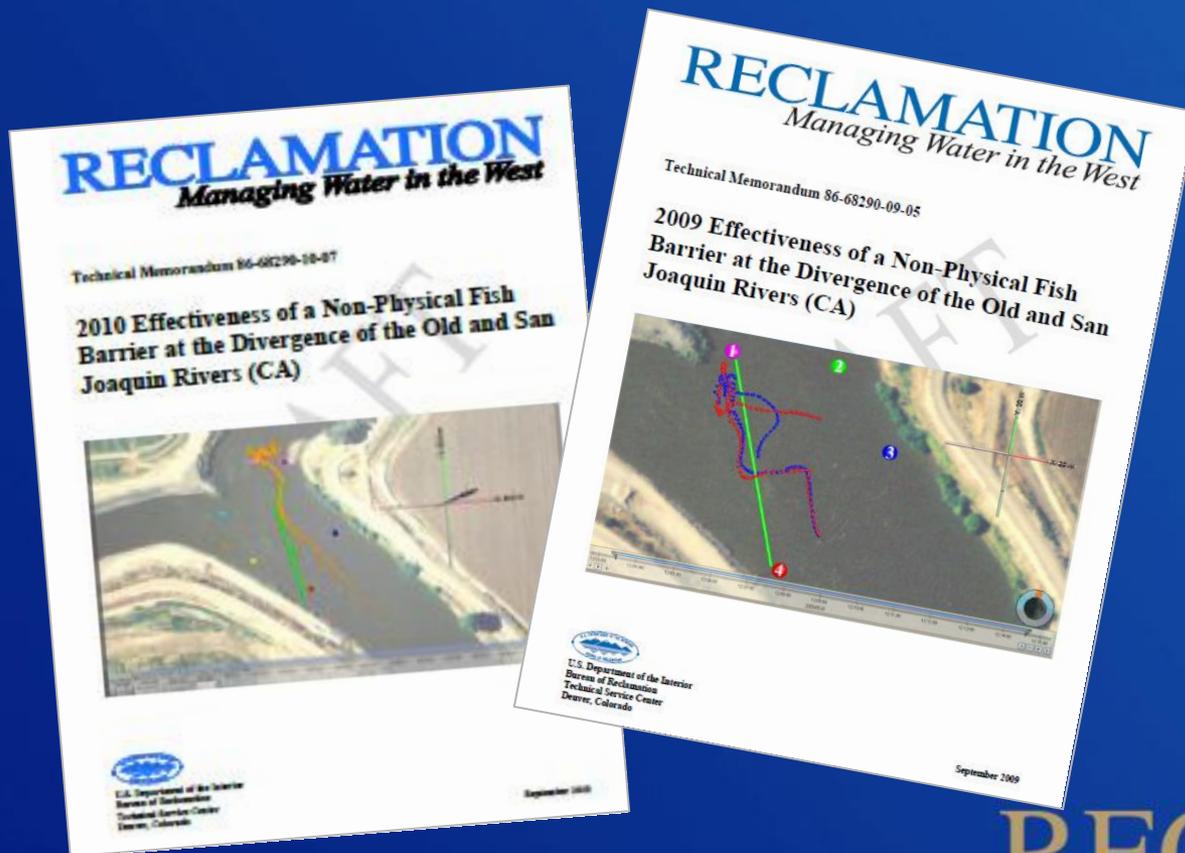
2011 Investigation: Chinook surrogacy



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2011 Investigation

Are outmigrating juvenile steelhead deterred from entering Old River by the non-physical barrier installed at this location during the VAMP period?



Methods:
No Head of Old River
non-physical barriers'
during 2011.

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2011 Investigation status

Done

- Successful field implementation of interagency telemetry investigation
- Tag Code information compiled by consultant team
- USFWS, USBR, DWR receiver data compiled

To Do

- USGS initiating data processing
- Complete survival model analysis
- Complete reporting



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2012 Investigation status

- Mokelumne R steelhead
- Merced R Chinook

- 3 Steelhead and 1 Chinook release
 - March release STH
 - April release STH
 - May release STH and FRC



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2012 Investigation Questions

- How many comparisons are necessary for evaluating surrogacy?
- If tag effect assumptions are studied, does the same stock for surrogacy comparisons need to be made or can other stocks be effectively used?



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