



NOAA
FISHERIES

Southwest
Region - Central
Valley Office

Spring 2012 Delta Operations per Joint Stipulation: Process

October 31, 2012

Outline

- Discussions leading to **Joint Stipulation** (Fall 2011)
- Discussions leading to **NMFS Technical Memorandum and “stipulation study”** (Winter 2012)
- **In-season adjustments** documented in NMFS Determinations (Spring 2012)

Why the Joint Stipulation?

Action IV.2.1: Inflow:export ratio

San Joaquin Valley Classification	Vernalis flow (cfs):CVP/SWP combined export ratio
Critically dry	1:1
Dry	2:1
Below normal	3:1
Above normal	4:1
Wet	4:1
Vernalis flow equal to or greater than 21,750 cfs	Unrestricted exports until flood recedes below 21,750.

Alternative delta operations for spring 2012



Case 1:09-cv-01053-LJO-DLB Document 680 Filed 01/19/12 Page 1 of 11

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

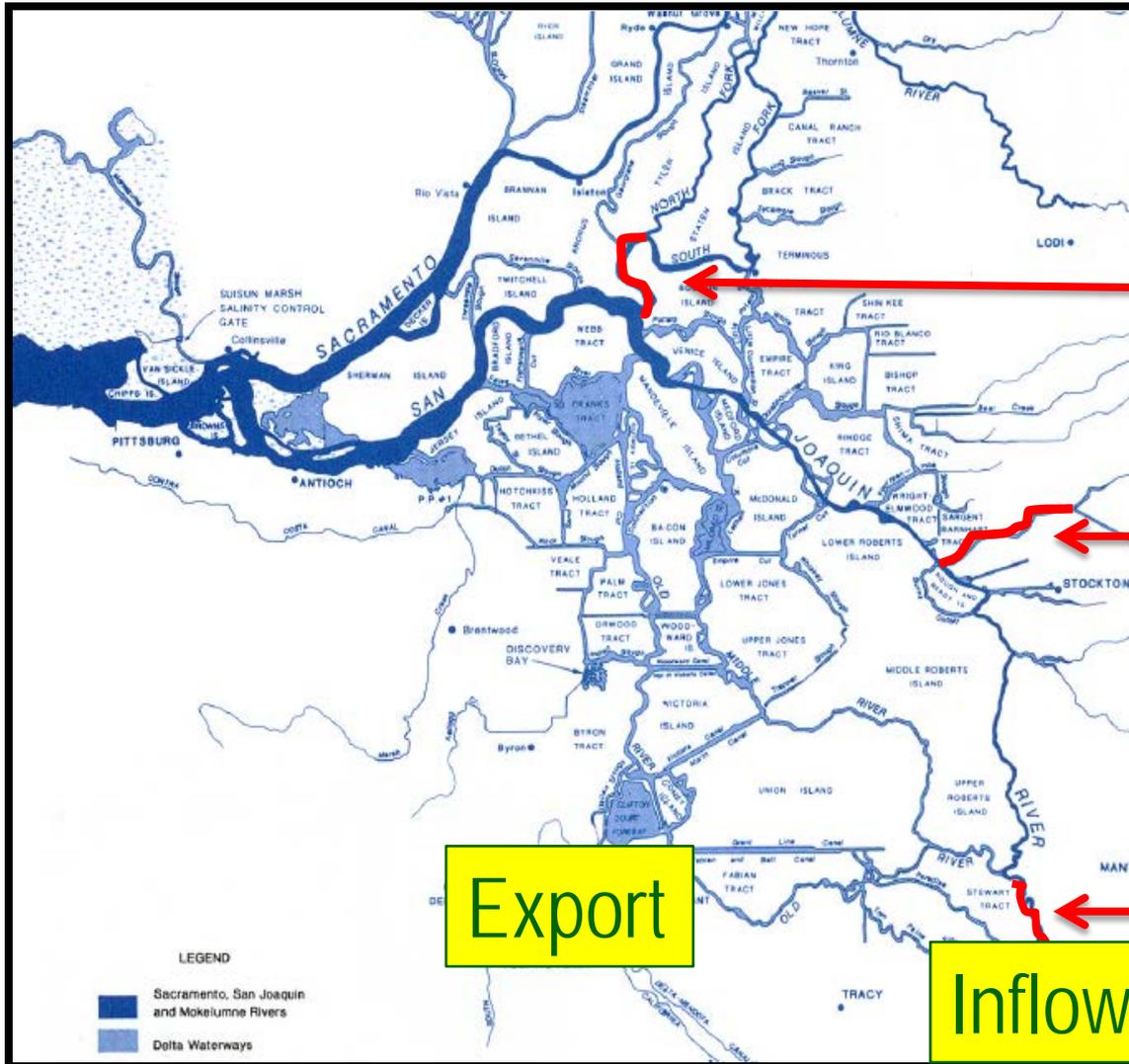
IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF CALIFORNIA

<p>THE CONSOLIDATED SALMON CASES</p> <p>SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, et al. v. GARY F. LOCKE, et al. (Case No. 1:09-cv-1053)</p> <p>STOCKTON EAST WATER DISTRICT v. NOAA, et al. (Case No. 1:09-cv-1090)</p> <p>STATE WATER CONTRACTORS v. GARY F. LOCKE, et al. (Case No. 1:09-cv-1378)</p> <p>KERN COUNTY WATER AGENCY, et al. v. U.S. DEPARTMENT OF COMMERCE, et al. (Case No. 1:09-cv-1520)</p> <p>OAKDALE IRRIGATION DISTRICT, et al. v. U.S. DEPARTMENT OF COMMERCE, et al. (Case No. 1:09-cv-2452)</p> <p>METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA v. NMFS, et al. (Case No. 1:09-cv-1615)</p>	<p>1:09-cv-1053-LJO-DLB</p> <p>1:09-cv-1090-LJO-DLB</p> <p>1:09-cv-1378-LJO-DLB</p> <p>1:09-cv-1520-LJO-DLB</p> <p>1:09-cv-2452-LJO-DLB</p> <p>1:09-cv-1615-LJO-SMS</p> <p>JOINT STIPULATION REGARDING CVP AND SWP OPERATIONS IN 2012</p> <p>Judge: Honorable Lawrence J. O'Neill</p>
---	--

1

JOINT STIPULATION REGARDING CVP AND SWP OPERATIONS IN 2012 (1:09-CV-1033 CWW DLB)

IV.2.1 Objective: Protect San Joaquin basin steelhead



Mokelumne River

Calaveras River

"Middle" San Joaquin River

Some key elements of the Joint Stipulation

Case 1:09-cv-01053-LJO -DLB Document 680 Filed 01/19/12 Page 1 of 11

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF CALIFORNIA

THE CONSOLIDATED SALMON CASES	1:09-cv-1053-LJO-DLB
SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, et al. v. GARY F. LOCKE, et al. (Case No. 1:09-cv-1053)	1:09-cv-1090-LJO-DLB 1:09-cv-1378-LJO-DLB 1:09-cv-1520-LJO-DLB 1:09-cv-2452-LJO-DLB 1:09-cv-1625-LJO-SMS
STOCKTON EAST WATER DISTRICT v. NOAA, et al. (Case No. 1:09-cv-1090)	JOINT STIPULATION REGARDING CVP AND SWP OPERATIONS IN 2012 Judge: Honorable Lawrence J. O'Neill
STATE WATER CONTRACTORS v. GARY F. LOCKE, et al. (Case No. 1:09-cv-1378)	
KERN COUNTY WATER AGENCY, et al. v. U.S. DEPARTMENT OF COMMERCE, et al. (Case No. 1:09-cv-1520)	
OAKDALE IRRIGATION DISTRICT, et al. v. U.S. DEPARTMENT OF COMMERCE, et al. (Case No. 1:09-cv-2452)	
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA v. NMFS, et al. (Case No. 1:09-cv-1625)	

1

JOINT STIPULATION REGARDING CVP AND SWP OPERATIONS IN 2012 (1:09-CV-1053 OWW DLB)

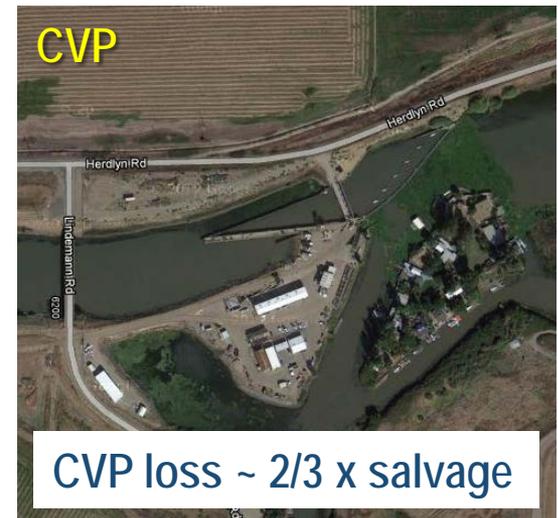
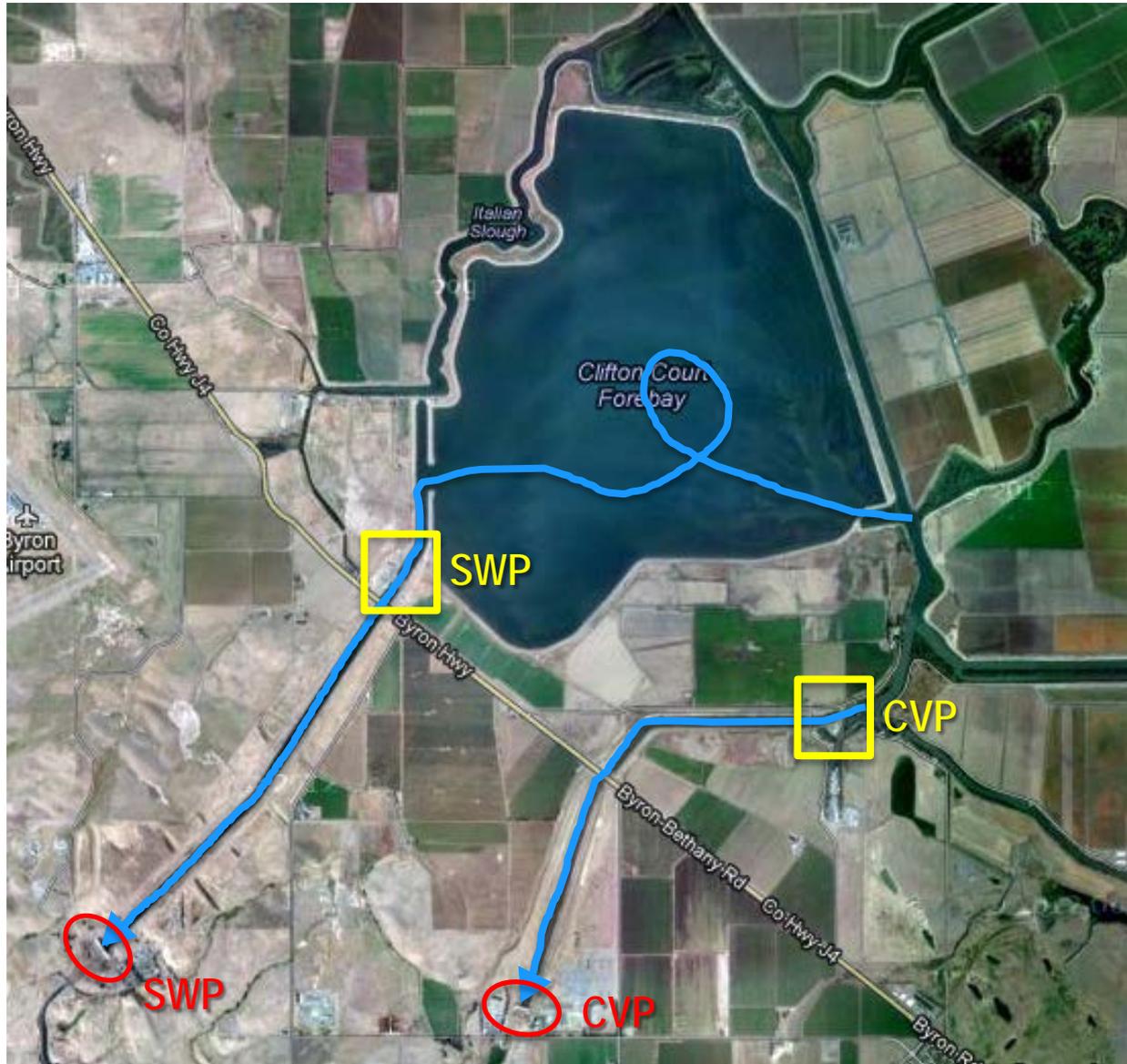
- Preferential diversion at the CVP
- Rock barrier at head of Old River
- Adaptive range of Old and Middle River flows

Preferential diversion at the CVP

- Shifting exports from SWP to CVP reduces loss at facilities



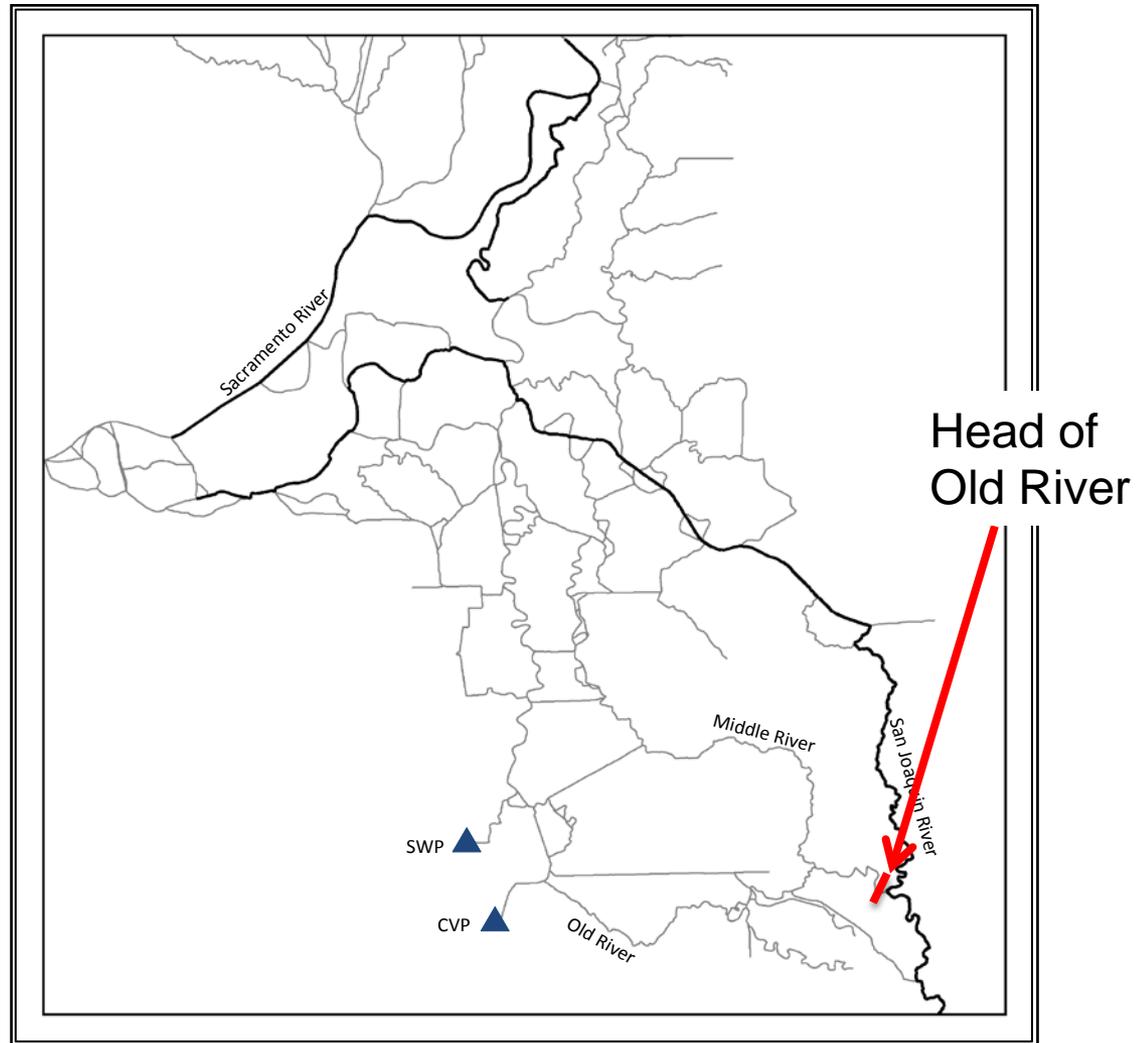
Fish Collection Facilities



Barrier at head of Old River

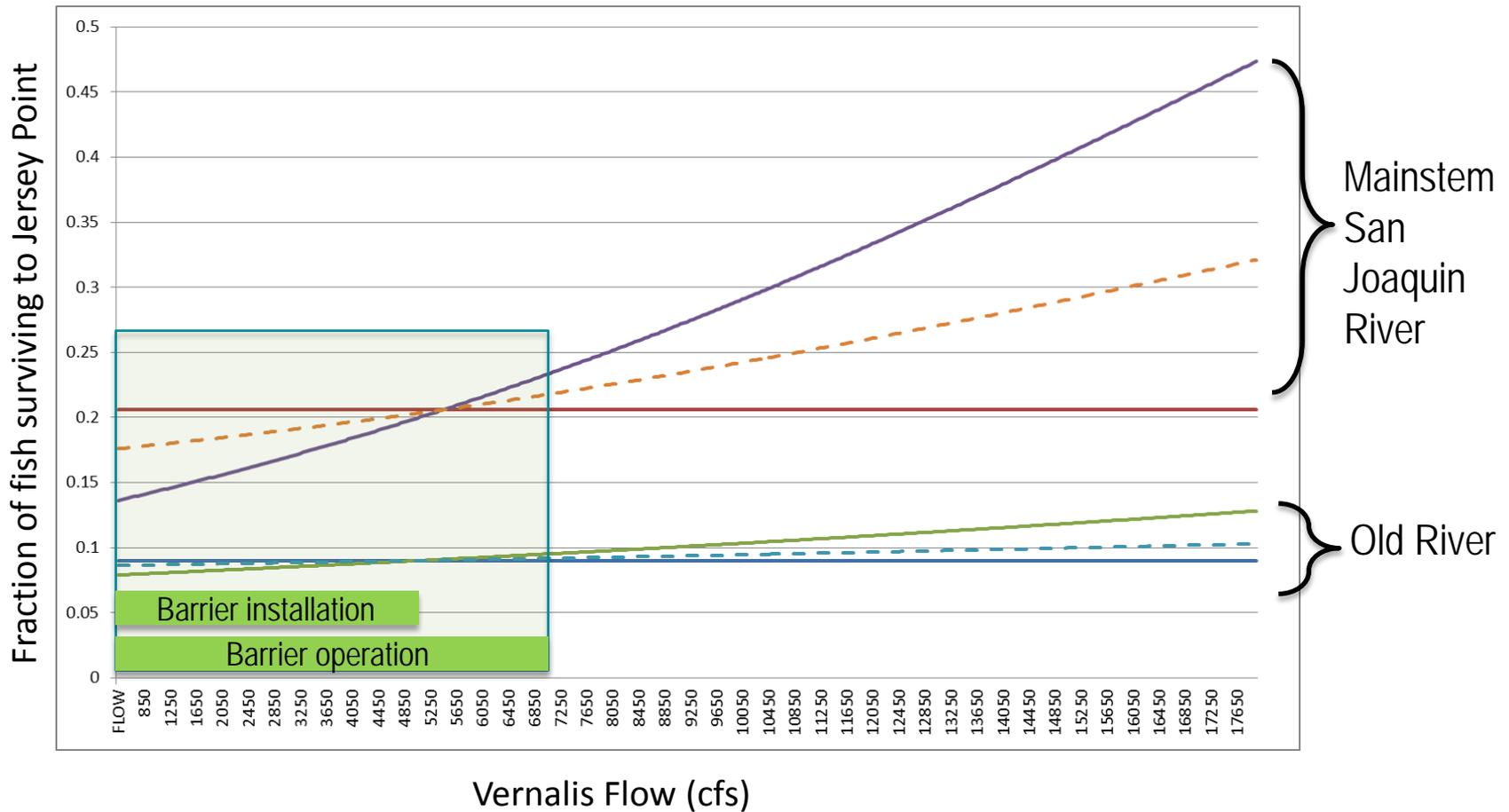
Whether?

- Relative survival in mainstem San Joaquin River vs. Old River route



Estimated survival relationships on the Old River (OR) and mainstem San Joaquin River (SJR) routes

(based on equations from Ken Newman's analysis of recoveries of coded wire tagged fish)



(Appendix C)

Barrier at head of Old River

Which?

- Barrier effectiveness



Barrier effectiveness

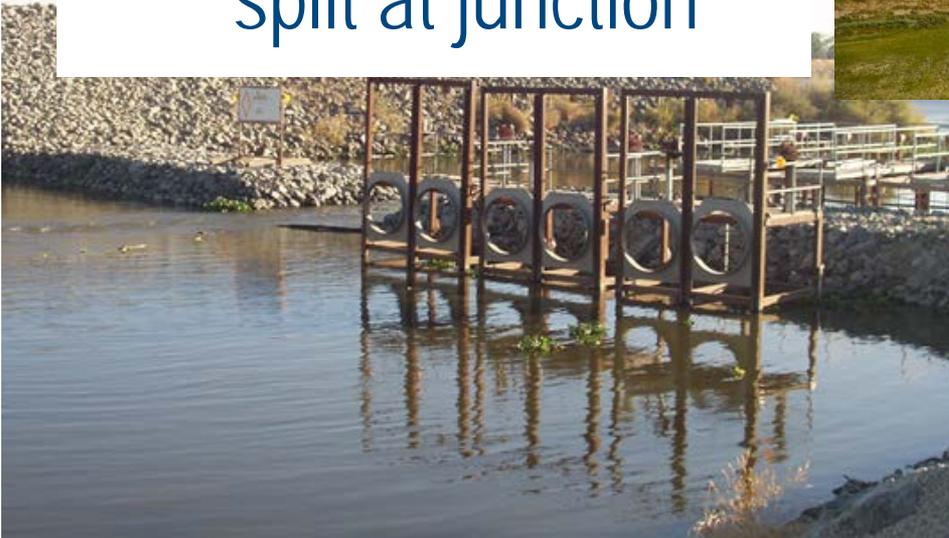
“High” means few fish enter Old River



Low flow	High flow
high	high
fairly high <i>2009: 2000-3000 cfs Mosssdale flow, 75% of flow entering OR</i>	Low <i>2010: 4000-6500 cfs Mosssdale flow, 58% of flow entering OR</i>

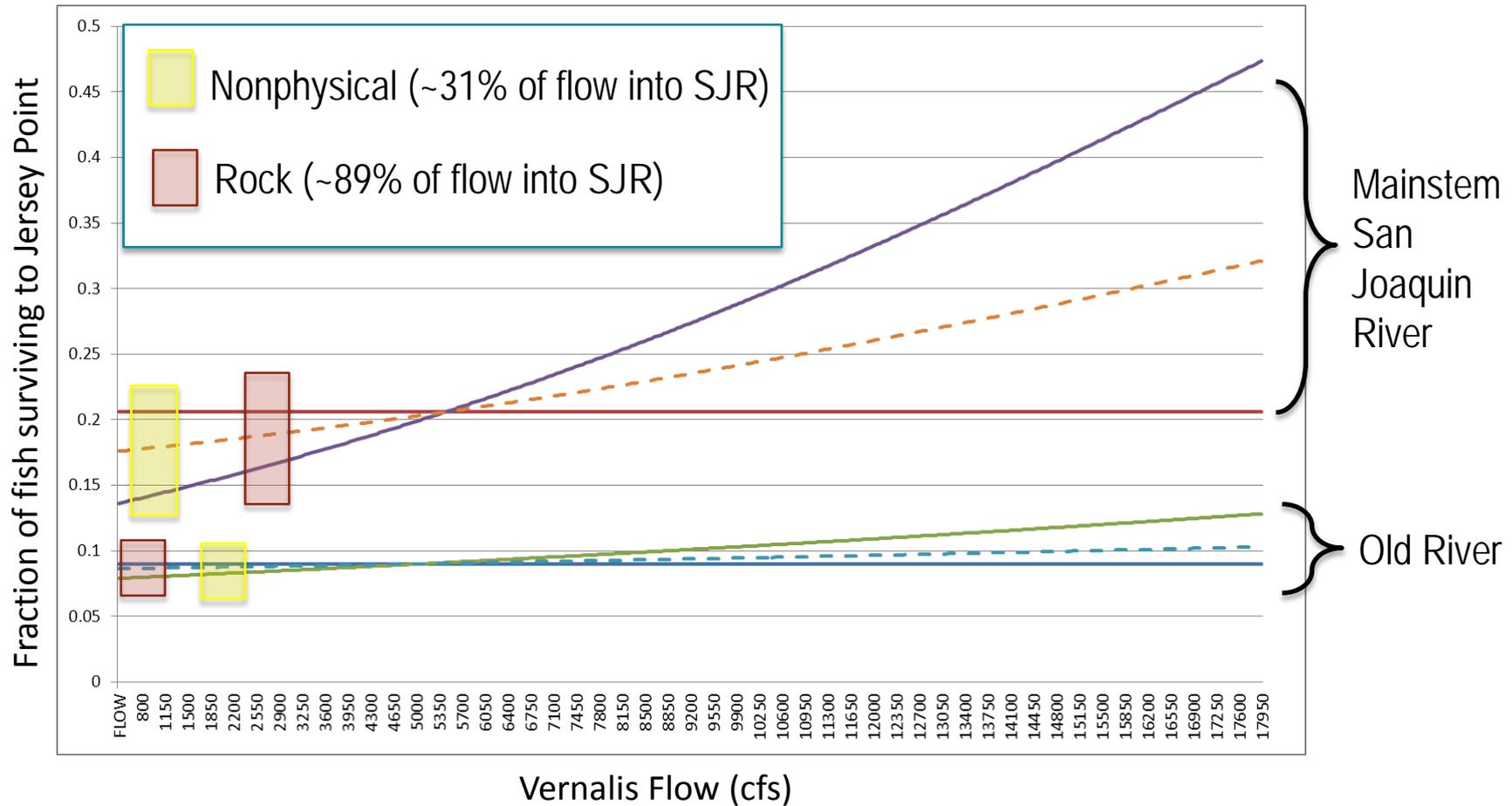
Barrier at head of Old River

- Which?
 - Barrier effectiveness
 - Effects on flow split at junction



Estimated survival relationships on the Old River (OR) and mainstem San Joaquin River (SJR) routes

(based on equations from Ken Newman's analysis of recoveries of coded wire tagged fish)



(Appendix C)

Barrier at head of Old River

- Which?
 - Barrier effectiveness
 - Effects on flow split at junction
 - Predation at barrier



Barrier at head of Old River

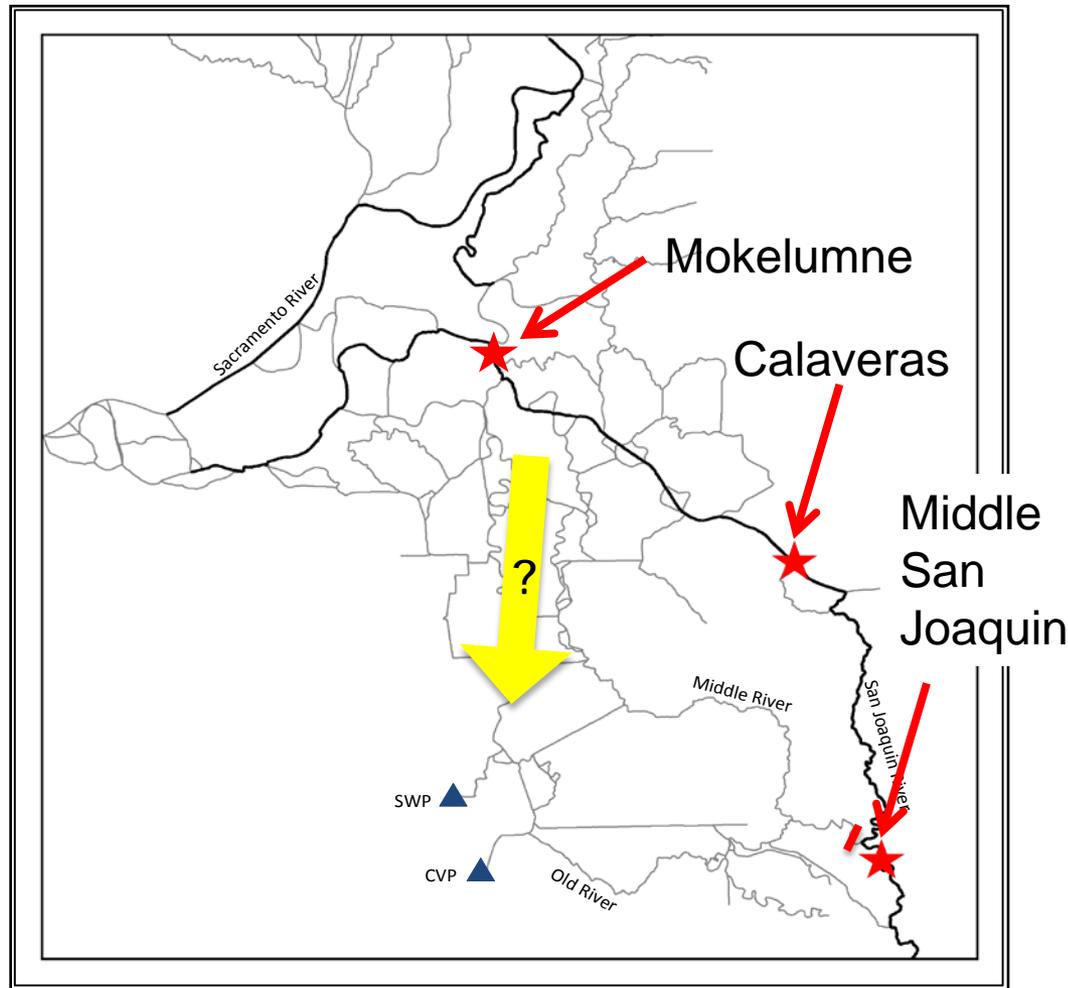
- Whether?
 - Relative survival in mainstem San Joaquin River vs. Old River route **ROCK, assuming SJ>OR**
- Which?
 - Barrier effectiveness **ROCK**
 - Effect on flow split **ROCK**
 - Predation at barrier **ROCK?**

Rock barrier at head of Old River has “downstream” effects

- Greater mainstem flow
- More negative OMR flows



Adaptive range of OMR flows in stipulation



Outline

- Discussions leading to Joint Stipulation (Fall 2011)
- Discussions leading to **NMFS Technical Memorandum and “stipulation study”** (Winter 2012)
- In-season adjustments documented in NMFS Determinations (Spring 2012)

OMR Technical Memorandum

Managed-risk Experimental Approach

- Protect San Joaquin basin steelhead
- Test hypotheses about OMR flows on fish movement and survival



OMR Technical Memorandum -- Timeline

January 12th – Approved joint stipulation filed (approved by court on January 19th)

February 3rd – Technical workshop on 2012 acoustic-tagging studies

February 7th – Technical workshop on OMR management

March 16th – NMFS issues technical memorandum on OMR adaptive management per the stipulation

April 1st – May 31st – Implementation of OMR management per the technical memorandum, including operation of a rock barrier at the head of Old River.

Technical memo operations in lieu of I:E ratio

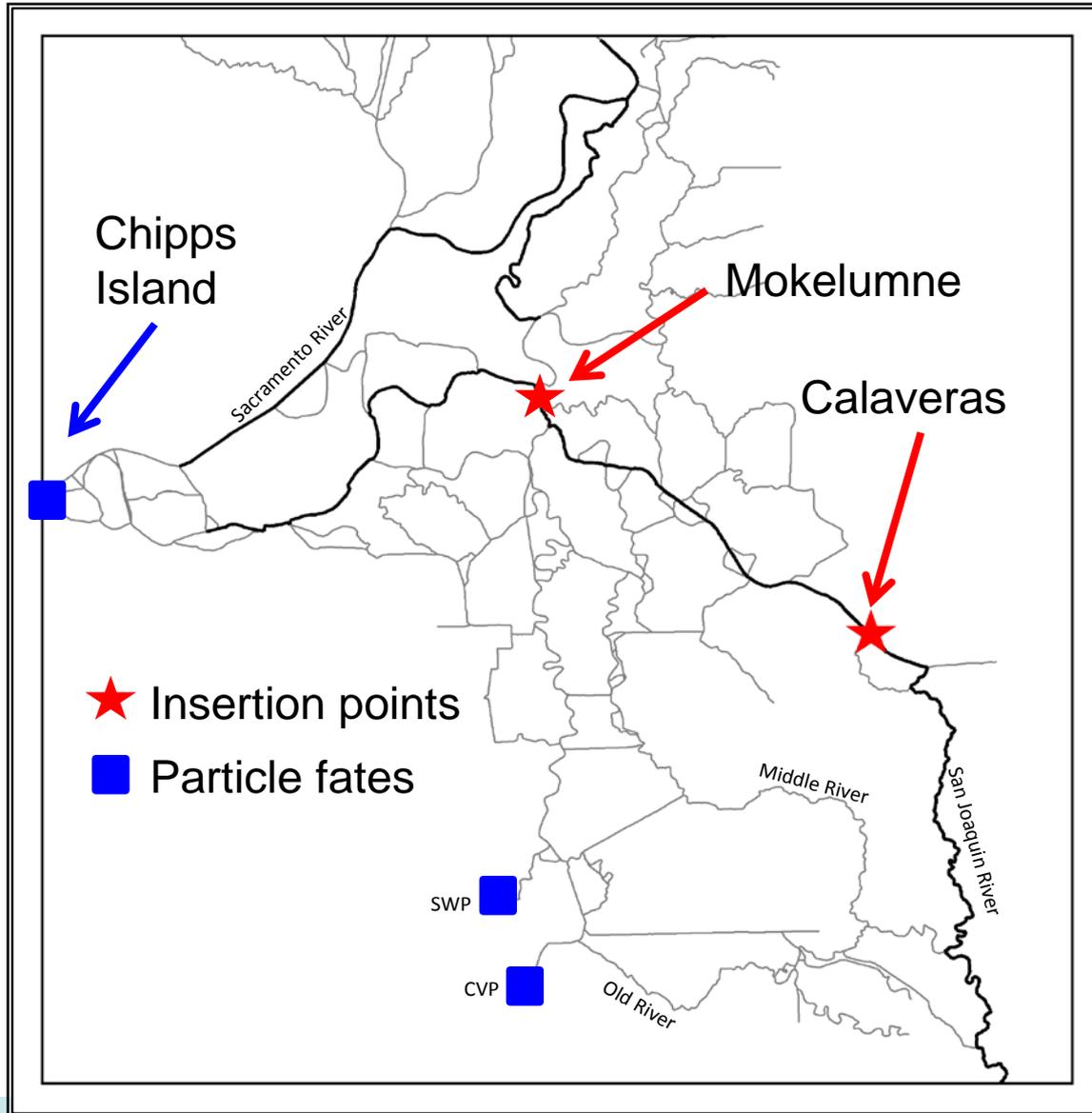
Management approach in Technical Memo	Period	Range of OMR allowed by stipulation
PTM modeling results	April 1- April 7	-1,250 to -3,500
PTM modeling results	April 8- April 14	
“sentinel” steelhead	April 15 – April 30	
“sentinel” steelhead	May 1 – May 14	-1,250 to -5,000
“sentinel” steelhead	May 15 – May 31	

OMR Technical Memorandum

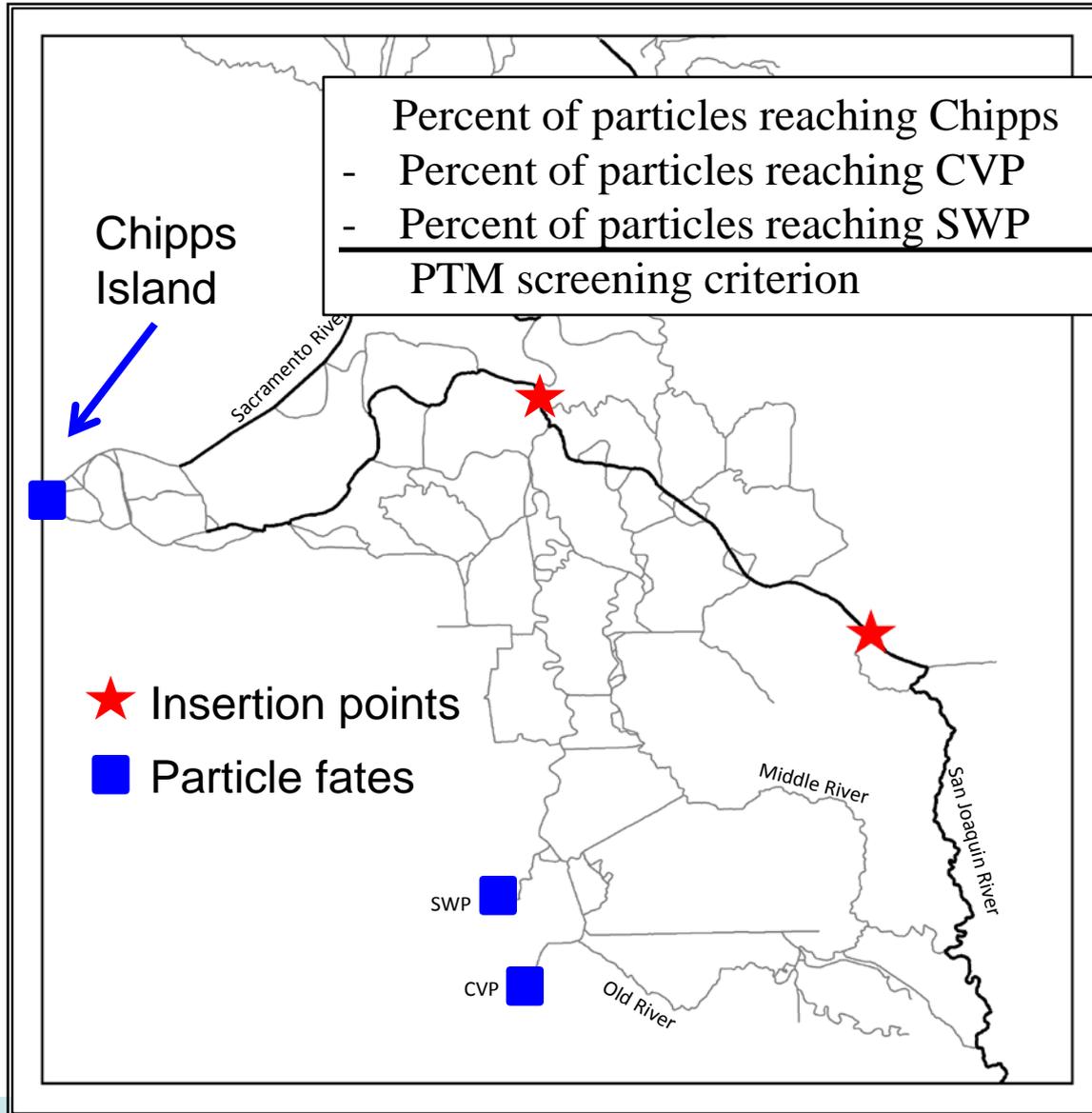
Other regulatory or operational constraints that may affect April-May operations:

- Action IV.2.3 from the NMFS BiOp
- Action 3 of the FWS BiOp
- D-1641 requirements
- Health and safety export levels

PTM approach to OMR management



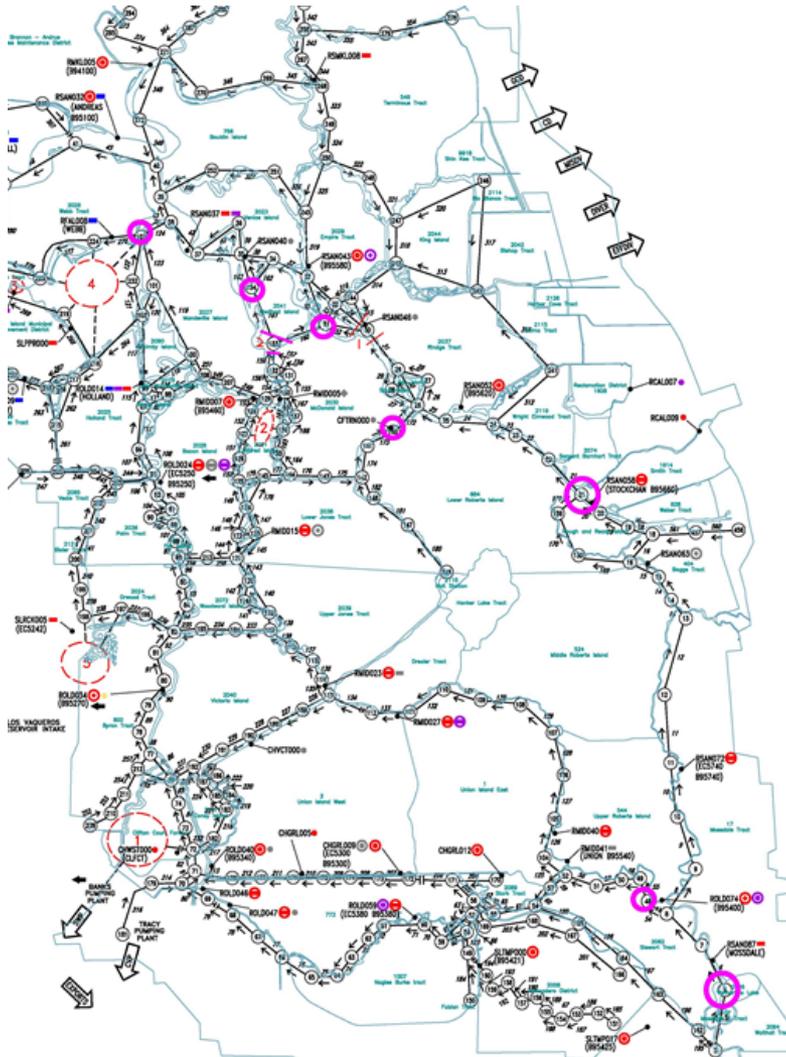
PTM approach to OMR management



PTM



"sentinel steelhead"



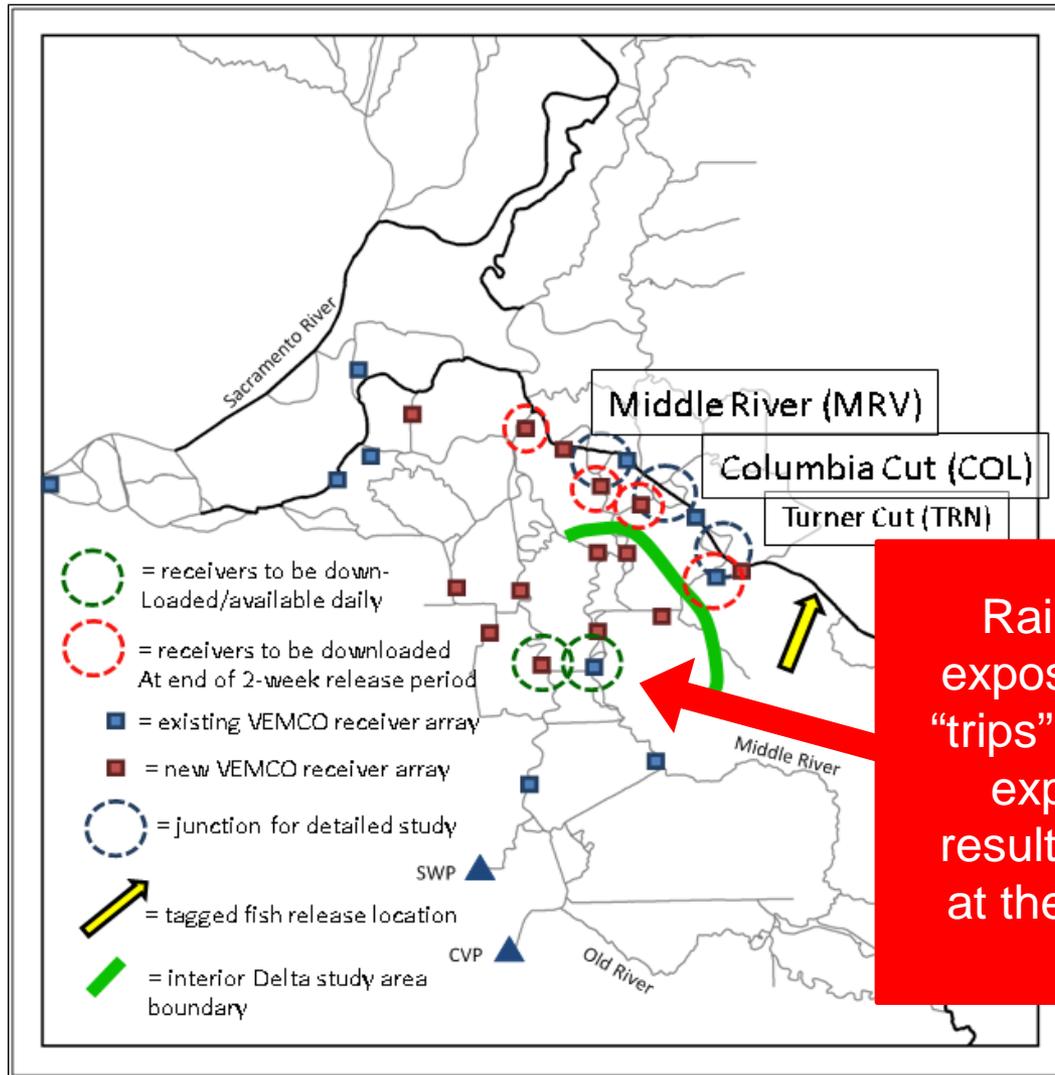
“Sentinel” approach to OMR management

- EXPERIMENTAL INFORMATION: Initial OMR levels

Management approach under joint stipulation	Period	OMR range allowed by stipulation	Planned Initial OMR
“sentinel” steelhead	April 15 – April 30	-1,250 to -3,500	-3,500* cfs
“sentinel” steelhead	May 1 – May 14	-1,250 to -5,000	-1,250* cfs
“sentinel” steelhead	May 15 – May 31	-1,250 to -5,000	-5,000* cfs

- PROTECTION OF STEELHEAD: -1,250 OMR, if exposure trigger exceeded

“Sentinel” approach to OMR management



Railroad Cut exposure trigger “trips” at the level expected to result in 2% loss at the SWP and CVP

Calculation of Railroad Cut trigger

	Acoustically Tagged Fish Released	166	
	Loss not to exceed (Trigger)	3.32	0.02
	Of fish that enter the CVP or SWP, proportion that enter the SWP	0.56	
	Of fish that enter the CVP or SWP, proportion that enter the CVP	0.44	
	Of fish that enter the CVP or SWP, proportion that enter the SWP	0.56	
	SWP salvage-to-loss Factor	4.33	
	CVP salvage-to-loss Factor	0.68	
	Expected salvage for every fish entering the SWP	0.187617261	
	Expected salvage for every fish entering the CVP	0.595238095	
	Expected loss for every fish entering the SWP	0.812382739	
	Expected loss for every fish entering the CVP	0.404761905	
	Check that expected SWP salvage * SWP salvage-to-loss factor = expected SWP loss	FALSE	0.812382739
	Check that expected CVP salvage * CVP salvage-to-loss factor = expected CVP loss	TRUE	
	Check that expected SWP salvage + expected SWP loss = 1	TRUE	
	Check that expected CVP salvage * expected CVP loss = 1	TRUE	
	facility, and the loss rate at each facility, what is the expected loss per fish that enter the SWP or CVP?	0.633029572	
	How many fish can encounter the SWP & CVP without exceeding the loss trigger?	5.244620704	3.16%
	Expected SWP Loss if N20 fish enter the facilities at the expected ratio	2.39	
	Expected CVP Loss if N20 fish enter the facilities at the expected ratio	0.93	
	Check that SWP loss + CVP Loss add up to loss trigger	TRUE	
	Migration Mortality Rate (per km)	0.03	
	Migration Survival for Average Distance from RR Cut to SWP/CVP	0.62	
	Fish at MR and OR (RR Woodward Island)	8.5	<-- watch this cell
	Fish at MR and OR (RR Woodward Island) rounded to nearest whole fish.	9	5.4%

Outline

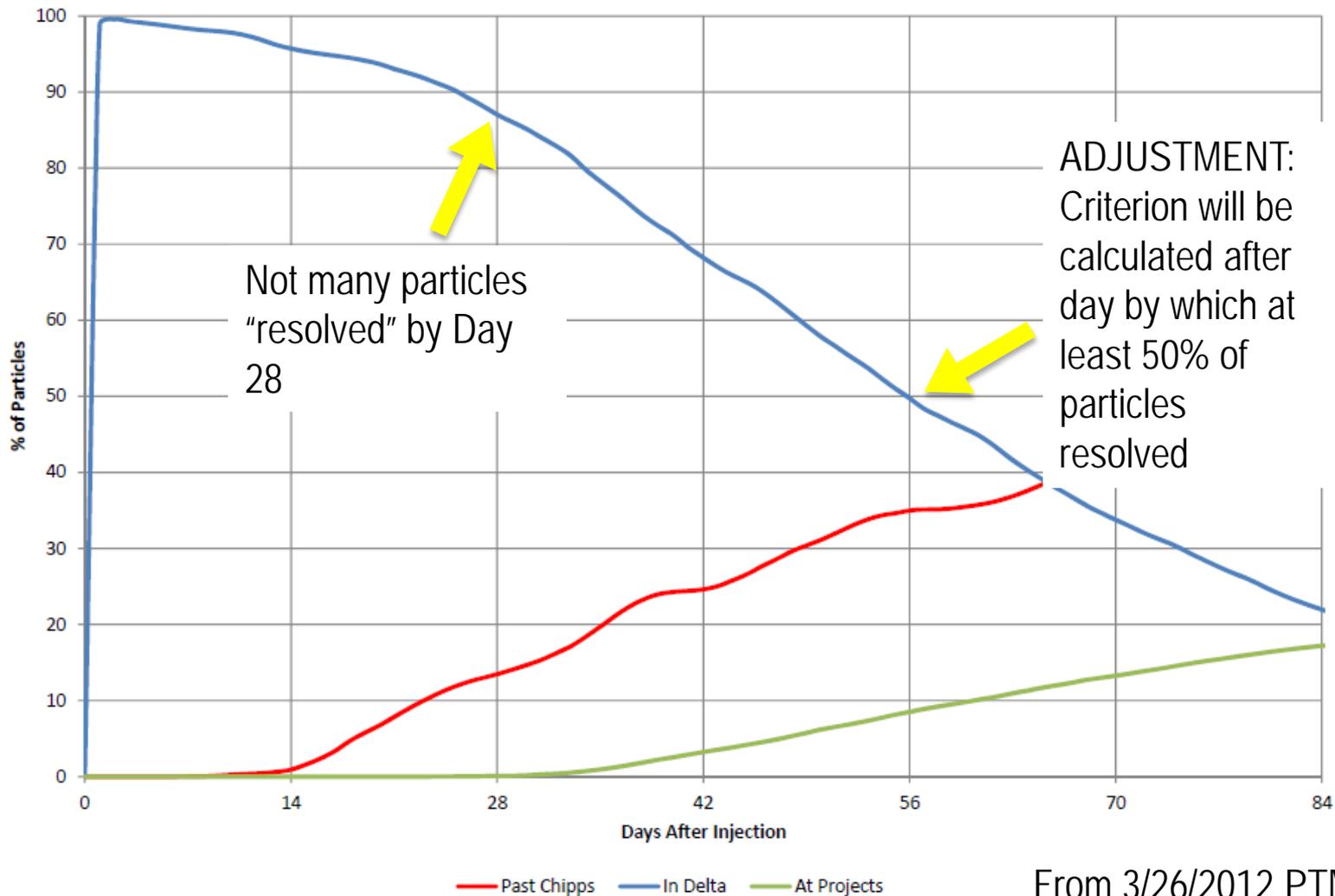
- Discussions leading to **Joint Stipulation** (Fall 2011)
- Discussions leading to NMFS Technical Memorandum and “stipulation study” (Winter 2012)
- **In-season adjustments** documented in NMFS Determinations (Spring 2012)

In-season adjustments

- PTM simulation length
- Order of OMR treatments
- Railroad Cut trigger value
- Duration of -1,250 protection period

In-season adjustments -- PTM simulation length

Scenario A



From 3/26/2012 PTM modeling

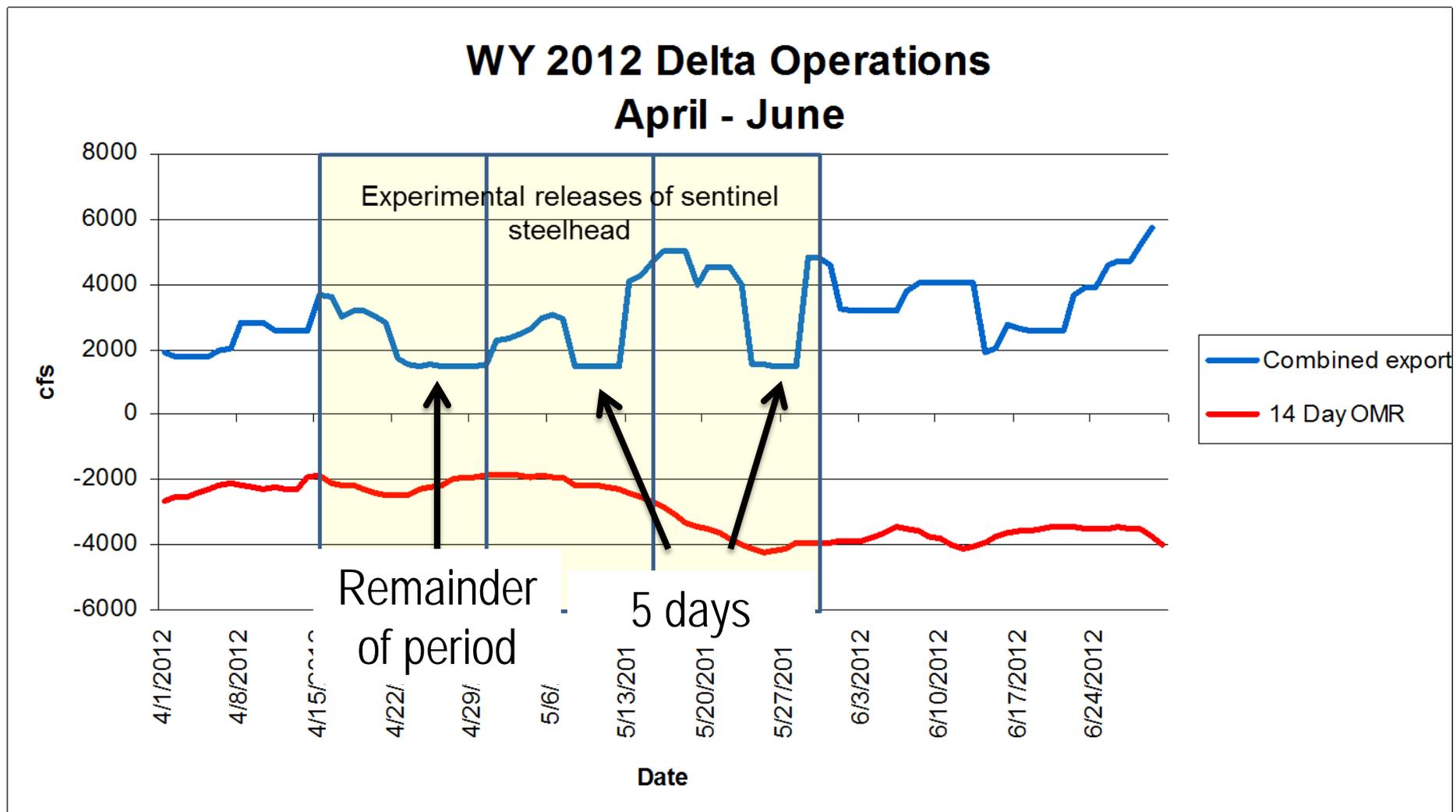
In-season adjustments -- Order of OMR treatments

	Period 1	Period 2	Period 3
Tech Memo	-3,500 cfs	-1,250 cfs	-5,000 cfs
Target	-3,500 cfs	-5,000 cfs	-5,000 cfs
Actual	-2,446 cfs	-2,933 cfs	-5,121 cfs

In-season adjustments -- Railroad Cut trigger value

Key trigger components	Value		
Release group size	166	167	167
SWP entry fraction	0.56	0.13	0.13
Survival (per km) between the Railroad Cut receivers and the CVP & SWP	97%	93.5%	92.3%
Railroad Cut Trigger (Number of tagged fish)	9	24	31
Trigger exceedance reported on:	Day 5	Day 4	Day 6

In-season adjustments -- Duration of -1,250 protection period





Questions?

Barb Byrne

barbara.byrne@noaa.gov