

Juvenile Salmonid Survival and Migration in the San Joaquin River Restoration Area Spring 2011 and 2012

**Fisheries Management Technical Feedback Group
November 2, 2012
Sacramento Ca**

**SAN JOAQUIN RIVER
RESTORATION PROGRAM**





Long Term Study Goals

- Characterize fish movement rates, route selection, and survival rates through the Restoration Area under variable flow conditions
- Investigate areas of potential losses due to predation and entrainment for further study
- Provide management direction for reintroduction implementation based on results

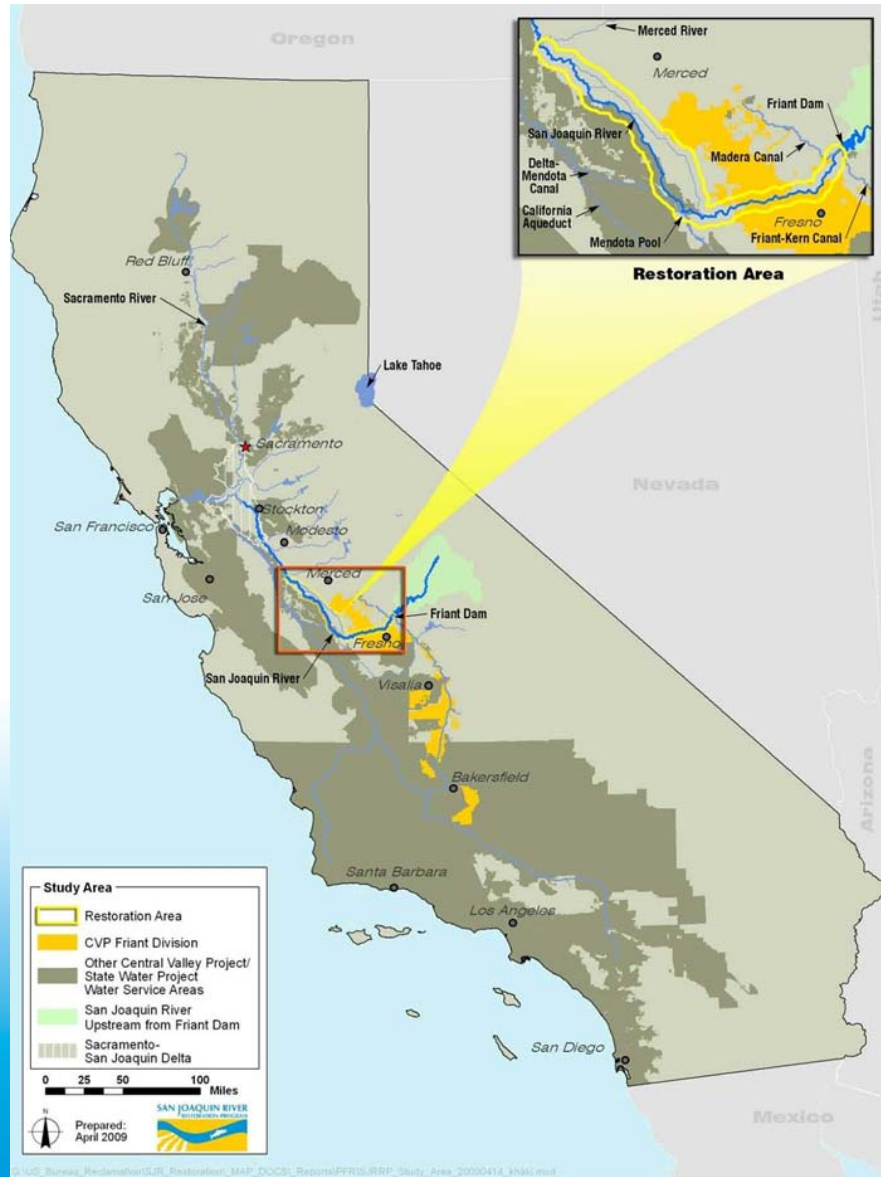


2012 Study Goals

- Assess movement characteristics of 2 age classes of Chinook Salmon
- Assess movement characteristics under various pulse flow scenarios
- Assess survival in Reach 1 and Reach 5 in an Critical High water year with no connectivity



Study Area



2011



2012

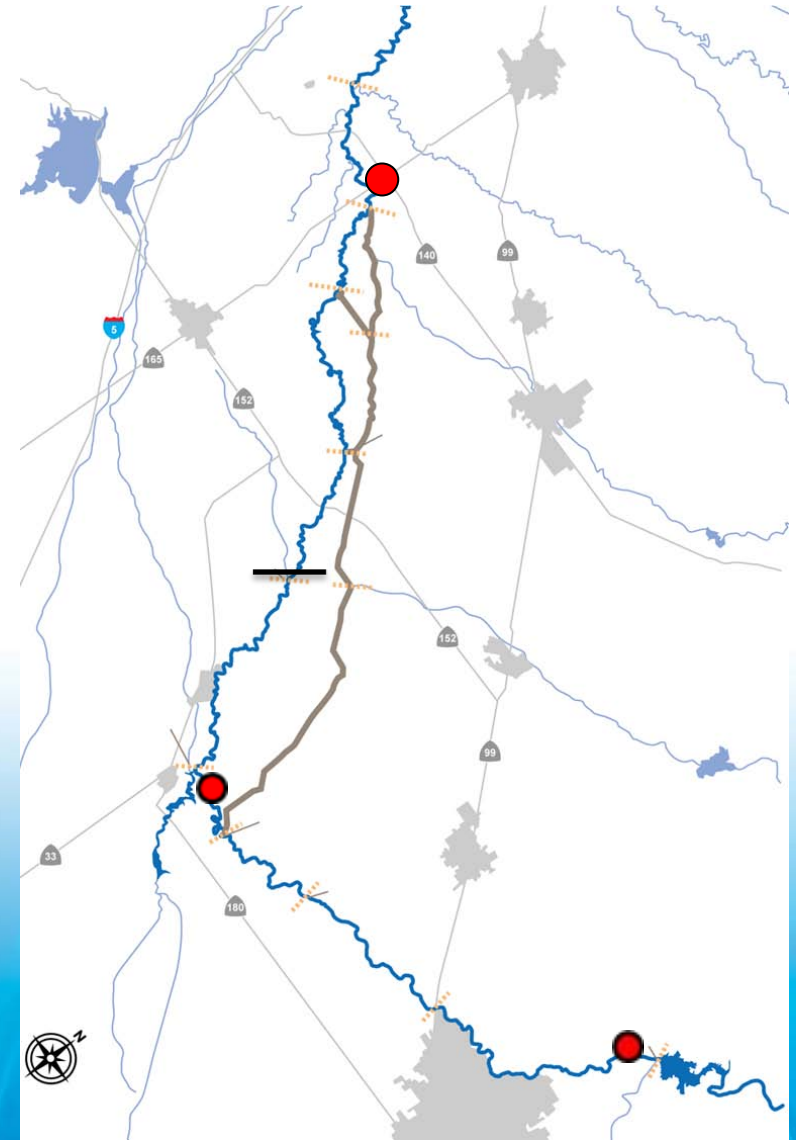
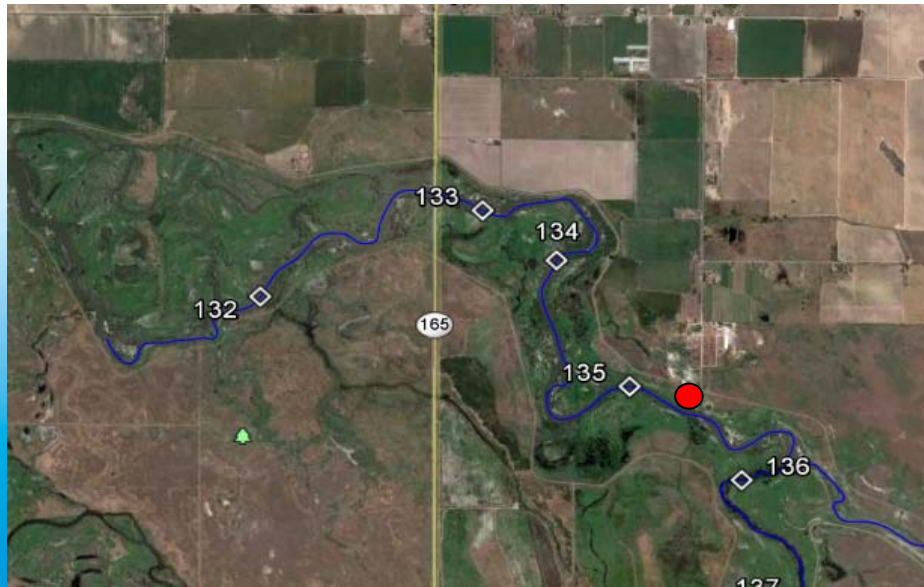


Methods

- 2011
 - 29 stationary receivers
 - Above and below mine pits, at decision points for fish migration
 - All reaches, and bypasses
 - Feather River YOY Fall Run Chinook salmon
 - 1200 fish (200 acoustic tagged) released at two locations on April 21, 2011, all CWT
- 2012
 - 36 stationary receivers
 - Higher density in reach 1, extended through confluences with San Joaquin tributaries
 - 1200 Feather River Fall Run / 200 BY 10 Merced Fall Run
 - CWT and PIT tagged
 - Released on 4 different flow levels from April 4 through April 23 in Reach 1 and Reach 5

Methods

- 2011 Release locations
 - Below Friant Dam, San Mateo Crossing
- 2012 Release Locations
 - Below Friant Dam, Reach 5 (upstream of HWY 165)



Methods

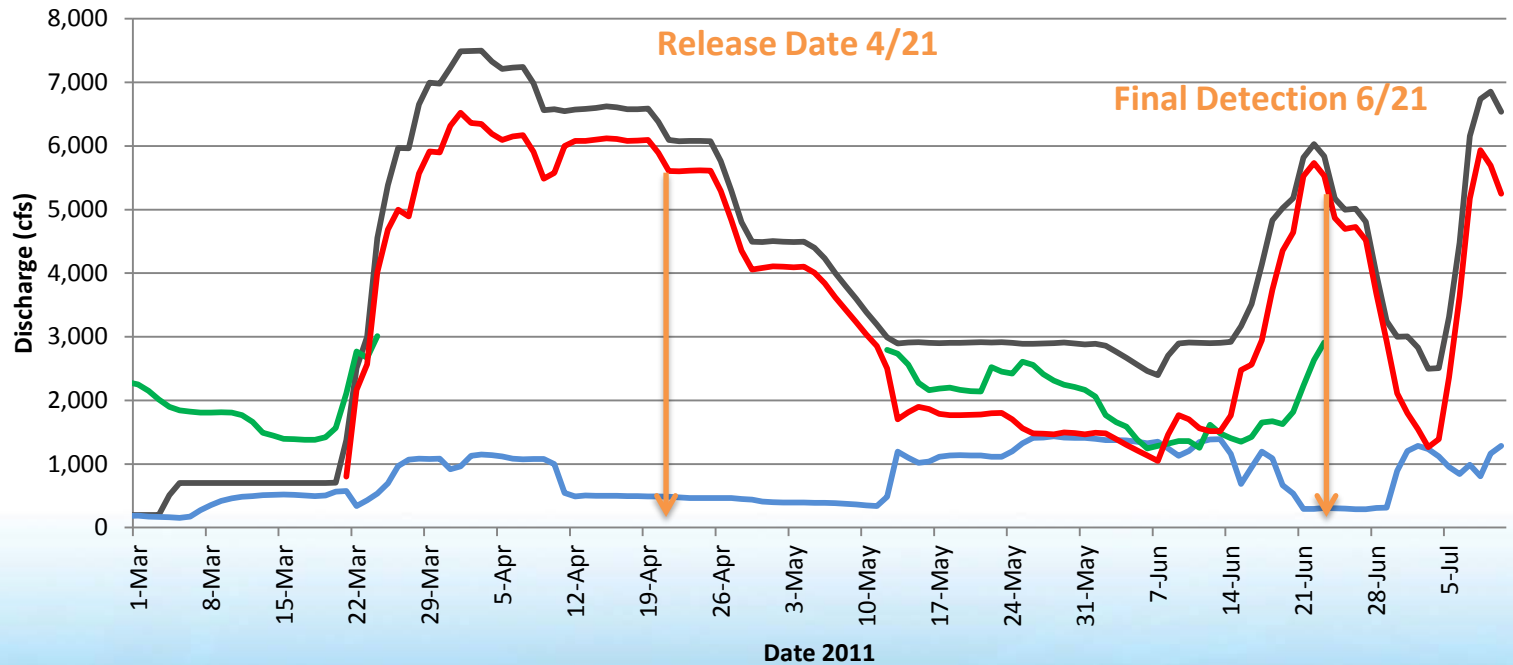
Table 2. Fish Release Summary for 2012 Juvenile Migration and Survival in the San Joaquin Restoration Area

Tag Date	Release Date	Release Location	Source Fish	# CWT	# PIT Tagged	# Acoustic	Flow
20-Mar-12	4-Apr-12	Below Friant	Merced BY10	100	100	50	350
9-Apr-12	16-Apr-12	Below Friant	Merced BY10	100	100	50	500
18-Apr-12	23-Apr-12	Below Friant	Feather River YOY	377	277	75	700
19-Apr-12	23-Apr-12	Upper Reach 5	Feather River YOY	352	0	75	700
25-Apr-12	30-Apr-12	Below Friant	Feather River YOY	819	743	75	1000
Total				1748	1220	325	



River Conditions

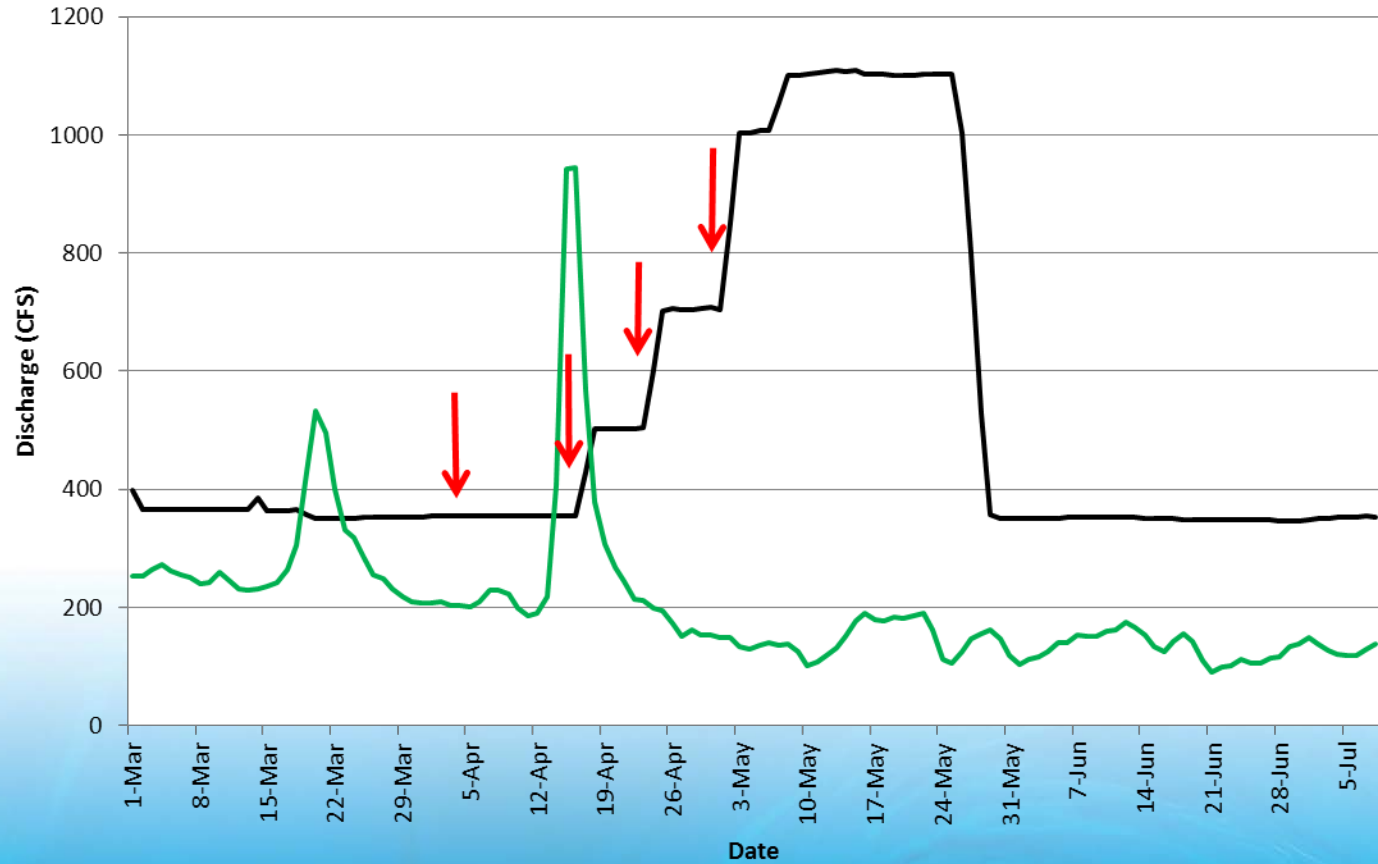
- 2011




— Friant Release (Provisional) — San Mateo Rd (Provisional) — above Merced River (Provisional) — bypass estimate

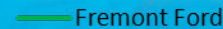
River Conditions

- 2012



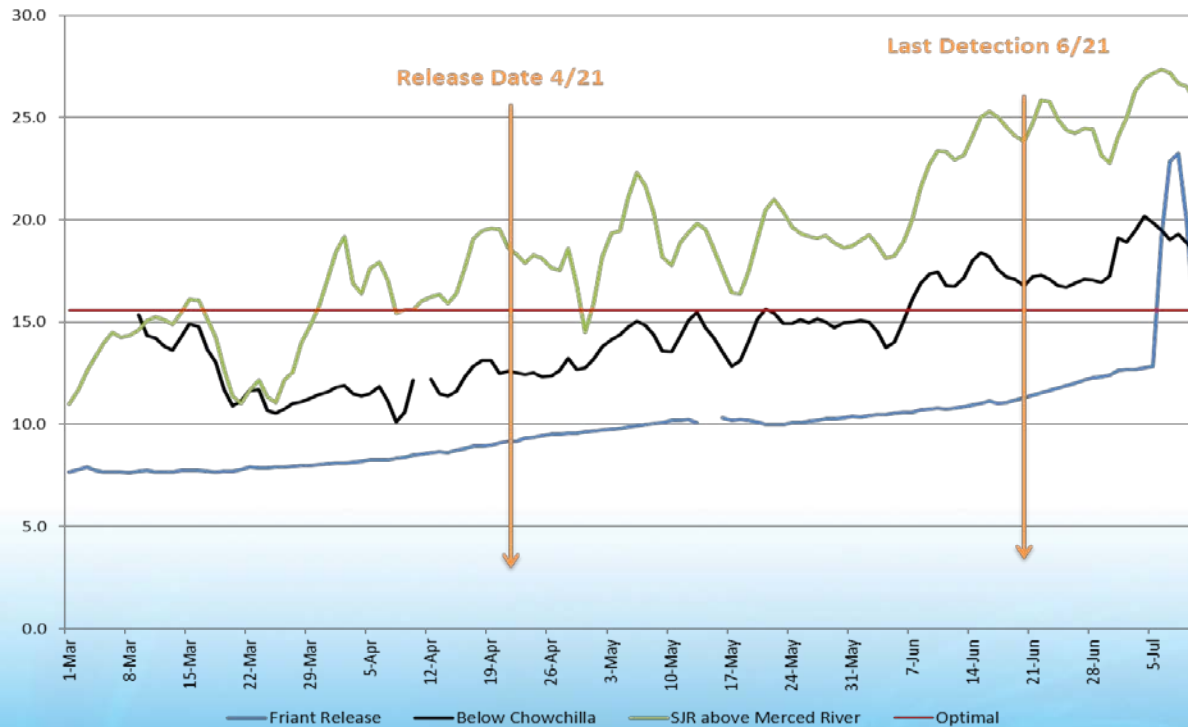
 Fish Release

 Friant Release

 Fremont Ford

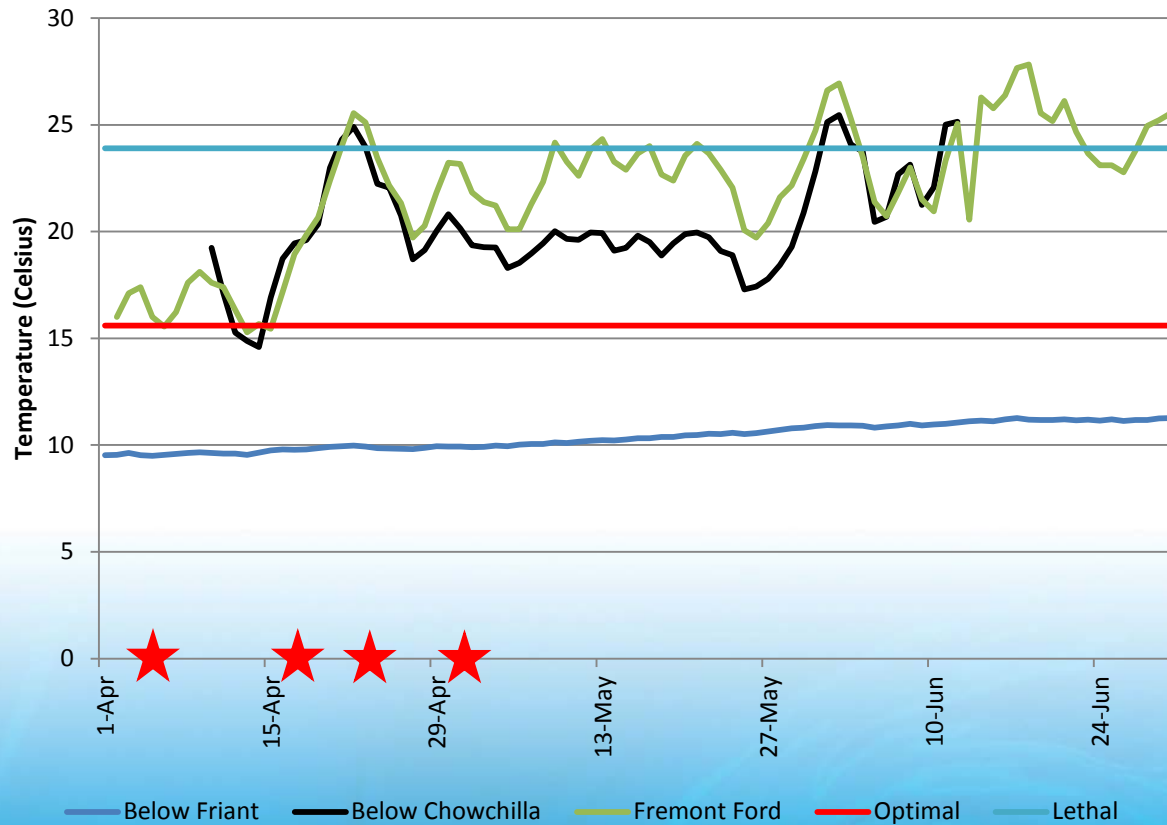
River Conditions

- 2011 Temperatures



River Conditions

- 2012 Temperatures

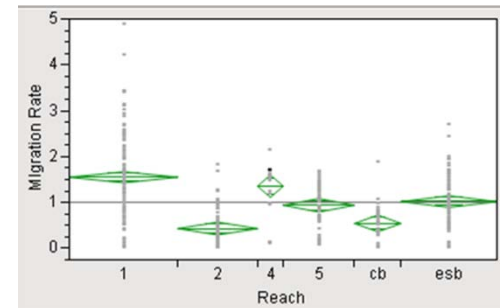


Results – Movement Rates 2011

Movement Rate by Release

Release Group	n	Average	Standard Deviation
Friant	308	1.07	0.04
San Mateo	141	0.84	0.06

n= number of detections



Reach 1



Reach 2



bypass



Reach 5

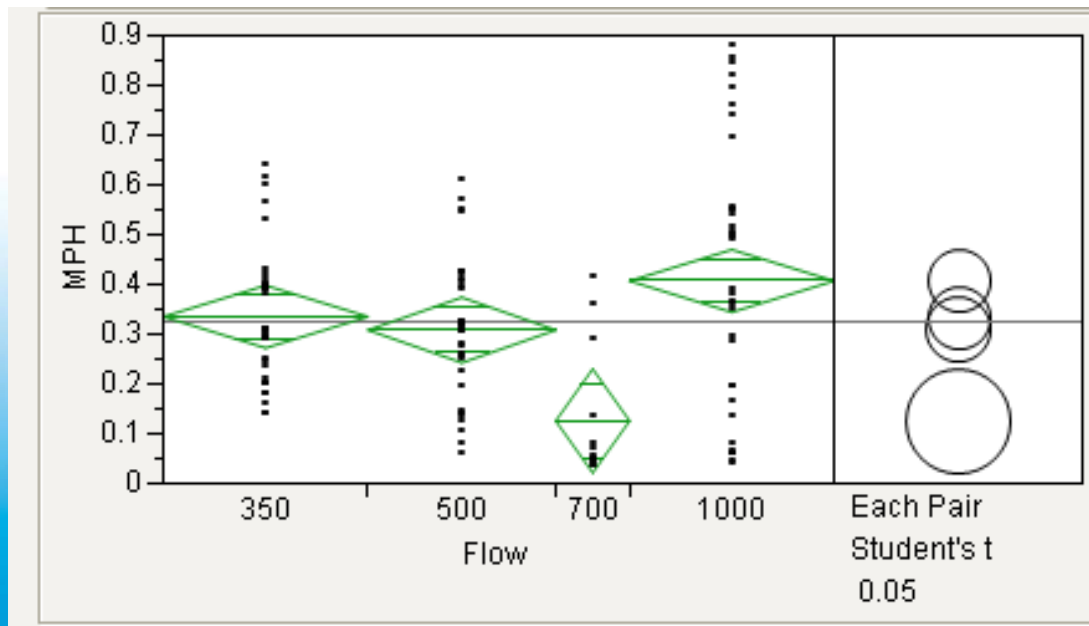
Movement Rate by Reach

	n	Average	Standard Deviation
Reach 1	116	1.53	0.99
Reach 2	82	0.44	0.41
Chowchilla	49	0.55	0.36
Eastside	101	1.02	0.58
Reach 4	28	1.31	0.55
Reach 5	75	0.94	0.45

Results – Movement Rates 2012

Movement Rate by Release

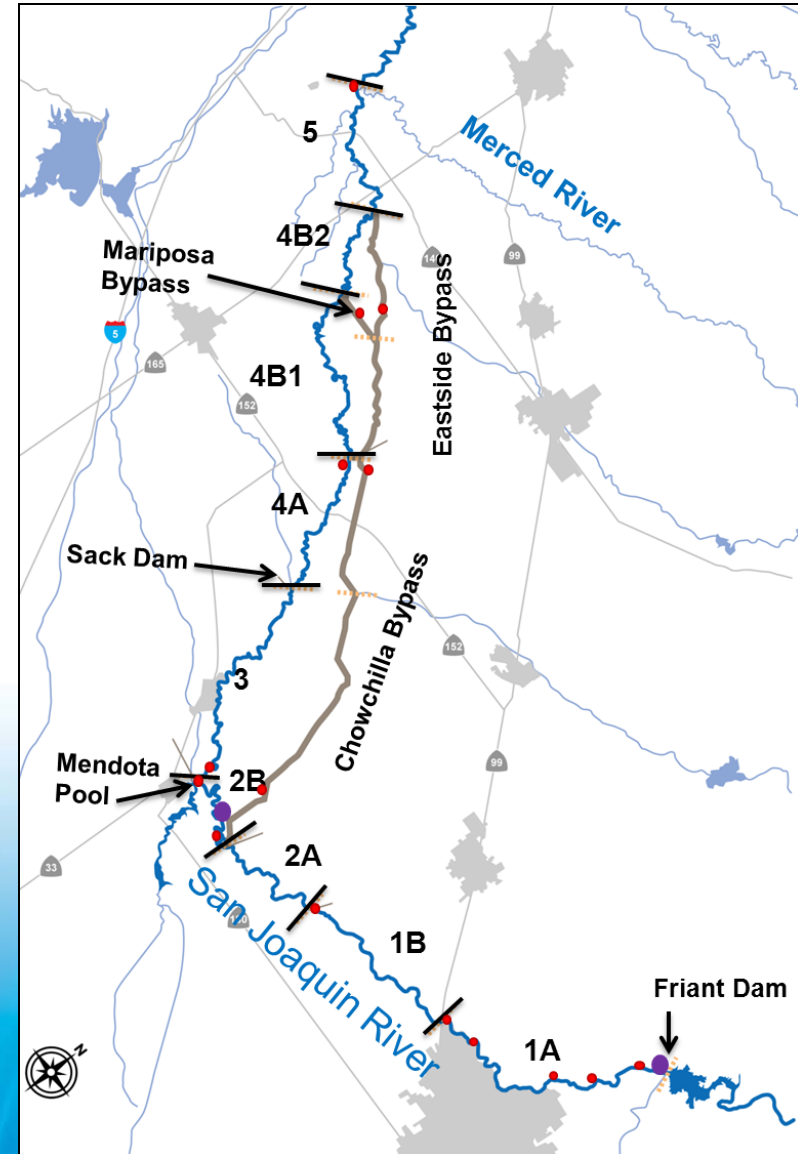
Release Group	AVG mph	MIN mph	MAX mph	STDEV mph	Flow
BY10BF404	0.335782	0.140763529	0.640514248	0.135801813	350
BY10BF416	0.308959	0.05879539	0.607965658	0.142519946	500
YOYBF423	0.126352	0.032528705	0.412792117	0.134790934	700
YOYBF430	0.407529	0.038489992	0.878539546	0.272988619	1000



Results – Survival - 2011

Survival Estimates and standard error for acoustic tagged juvenile Chinook salmon in the San Joaquin River Restoration Area, Spring 2011.

Release Group	Survival Location	Estimate of Survival
Friant (RM 265)	Hwy 99 (RM 234)	0.78 (0.02)
Friant (RM 265)	Hills Ferry Barrier (RM 118)	0.55(0.04)
San Mateo (RM 212)	Mendota Pool (RM 205)	0.46(0.05)
San Mateo (RM 212)	Below Mendota Pool (RM 204)	0.31(0.06)
San Mateo (RM 212)	Hills Ferry Barrier (RM 118)	0.27(0.08)



Results – Survival - 2012

Release Group	Discharge (cfs)	2012 Survival Estimate to Location			
		Lost Lake (RM265)	Hwy 99 (RM234)	San Mateo Crossing (RM 212)	Mendota Pool (RM 205)
BY10BF404	350	96%	72%	51%	30%
BY10BF416	500	93%	73%	22%	7%
YOYBF423	700	79%	24%	6%	0%
YOYBF430	1000	94%	48%	9%	0%
*YOYR50423	Survival = 0% . All detected immediately downstream of release, none detected further downstream				

- For all Friant Releases, survival only measured to Mendota Pool – no river connectivity in 2012
- There was no detectable survival for the Reach 5 releases.

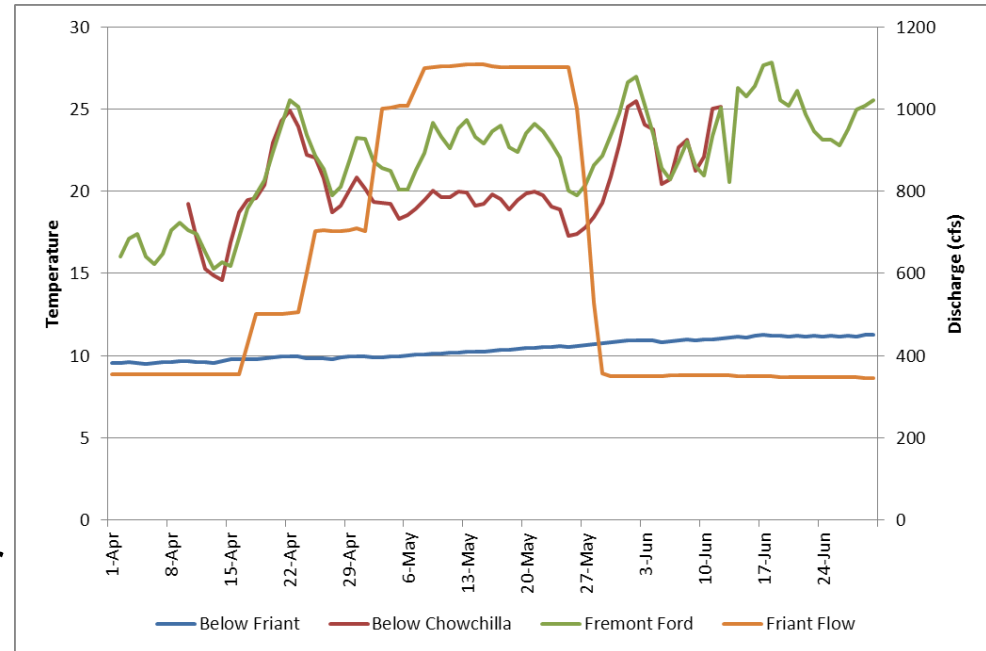


Results

- BY 10 fish
 - 1 fish detected through all receivers to Fresno Slough (James Bypass). Then seen 10 days later upstream of the Merced confluence, then consistently seen moving downstream.

Conclusions

- 2011 – flood conditions
 - High survival to Hwy 99
 - Good survival to HFB
 - Moderate Temperatures
- 2012 – no connectivity
 - Survival to Hwy 99 – high for BY10 fish, but not YOY
 - Survival to Mendota Pool poor
 - High temperatures in Reaches 3 through 5



River Road in Newman 2011

2013 Study Plans

- Releasing YOY Feather River fall-run
 - below Friant
 - at downstream “connected River” (reach 4 or 5)
 - Releases in the mine-pit reach of the river (RM 261-RM 233)
- Continue to coordinate with USBR PIT tag study
- Each year study plans will be coordinated with flow releases/operations; and to answer high priority questions as determined by the FMWG in coordination with the TAC

Questions?

