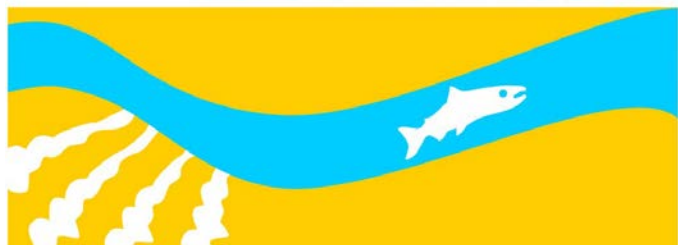


Fish Assemblage Inventory and Monitoring

August 2013

SAN JOAQUIN RIVER
RESTORATION PROGRAM



Long term Fish Assemblage Inventory and Monitoring Study (Preliminary Data Report)

Introduction

The San Joaquin River once supported healthy populations of native fishes, most notably Chinook salmon (*Oncorhynchus tshawytscha*). Changes in land use, the construction of Friant dam, irrigation canals, and flood bypasses has dramatically altered the flow regime, and habitat types. The Restoration Goal for the San Joaquin River Restoration Program (SJRRP) is “to restore and maintain fish populations in ‘good condition’ in the main stem San Joaquin River below Friant Dam to the confluence with the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish” (*Natural Resources Defense Council (NRDC) vs. Rodgers et al.*, 2006). To assess achievement of this goal, an inventory and monitoring program is being conducted to identify fish abundance and diversity within the restoration area to create a baseline fish assemblage during the beginning stages of restoration. Fish sampling with chronological analysis of the temporal and spatial distribution, relative abundance, and diversity of will help with SJRRP’s assessment of the Restoration Goal’s success. This information can be used to adaptively manage future efforts for a more effective implementation of the Restoration Goal. In 2012 USFWS implemented standardized sampling protocols and sampled sites to assess changes in fish populations before, during, and after restoration activities. Sites will be sampled quarterly, and were sampled twice in in 2012, and 3 times in 2013, with another sampling planned for October of 2013. This study is a joint project with US Fish and Wildlife and the US Bureau of Reclamation. The preliminary report here represents only the information directly obtained by the USFWS, the final report will be prepared in conjunction with our USBR partners.

Methods

The study area consists of the stretch of the San Joaquin River from Friant Dam to the Merced River confluence. (Figure 1) This stretch of river has been delineated into 5 reaches.

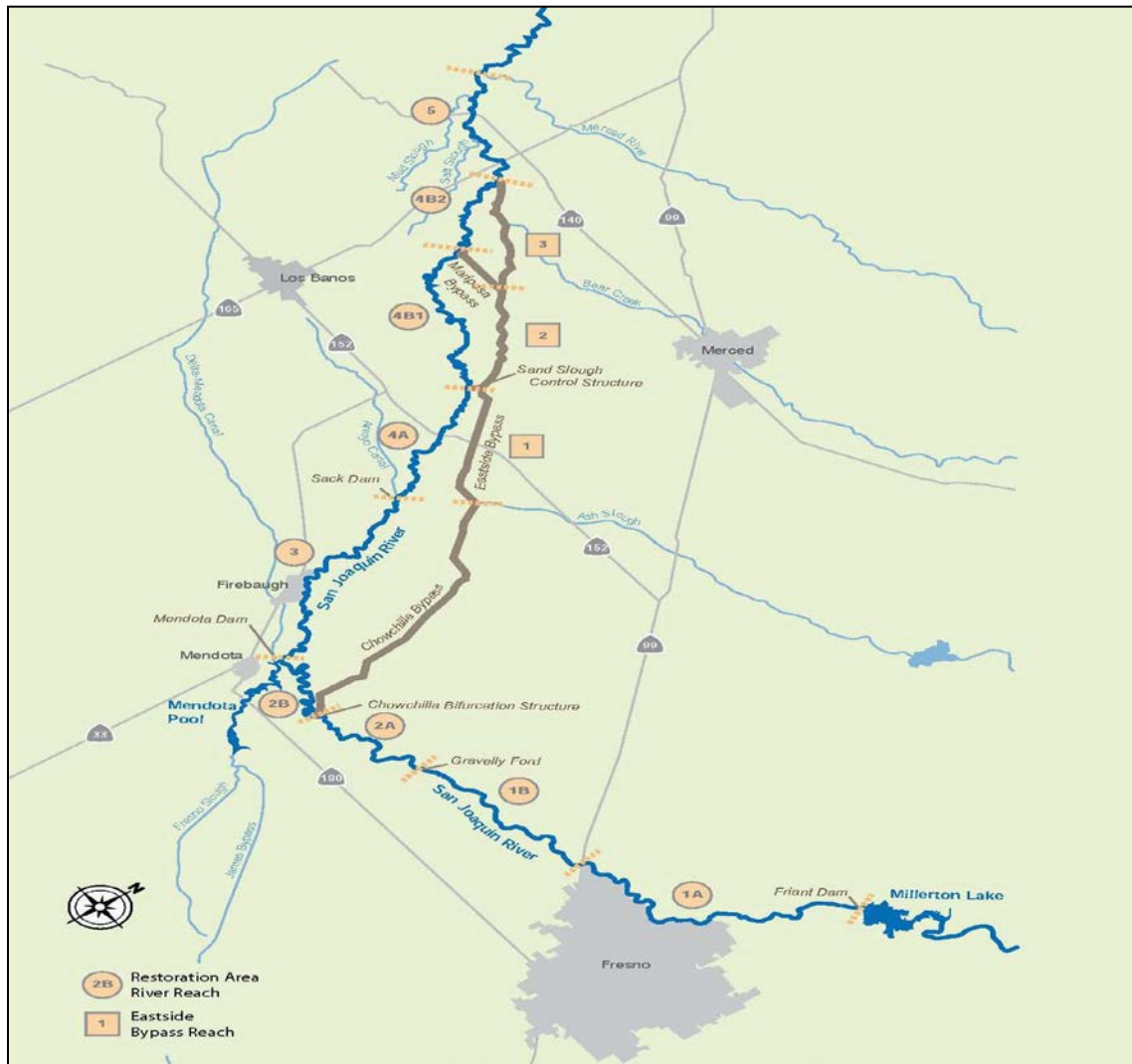


Figure 1. Detailed map showing the Restoration Area (i.e.: the study reach), Friant Dam to the Merced River confluence.

When possible all habitat types (run, riffle, pool, glide, off channel habitat) within each reach were sampled with the appropriate gear (Seine, Backpack Electroshocker, and Boat Electroshocker). The lack of river access and low water levels limited our sampling efforts in the lower reaches.

Each site was sampled once per quarter with the method that was best suited to the habitat type. Sample gear was kept consistent for sites that were sampled in multiple seasons. All fish captured were identified to the species level, measured to the nearest mm, weighed, and released alive unless otherwise noted. Environmental data was recorded at all seines and backpack shocking sites; this included dissolved oxygen, Temperature, and Turbidity. Water velocity was measured and area sampled including depths allowing calculation of CPUE in fish per meter cubed. When electroshocking the times shocked was recorded for CPUE calculations.

Boat electroshocking was conducted by CDFG, and USBR in large deep water such as deep glides and pools using boat and raft electrofishers.

Backpack shocking was used by USFWS in wadeable areas with complex habitat that prevented effective seining, areas with irregular substrate contours and woody debris. At some sites the fish were

netted with hand nets, but if the current was swift a block net was created using the seine and the fish were shocked into it.

Seining was conducted by USFWS in shallow areas with little to no current, and free from snags. Sample sites within each reach were spread out to provide representation of habitat availability throughout the reach. An effort was made to sample the entire reach; but limited access in reaches 2 and 3 caused those sites to be clumped (Figure 2).

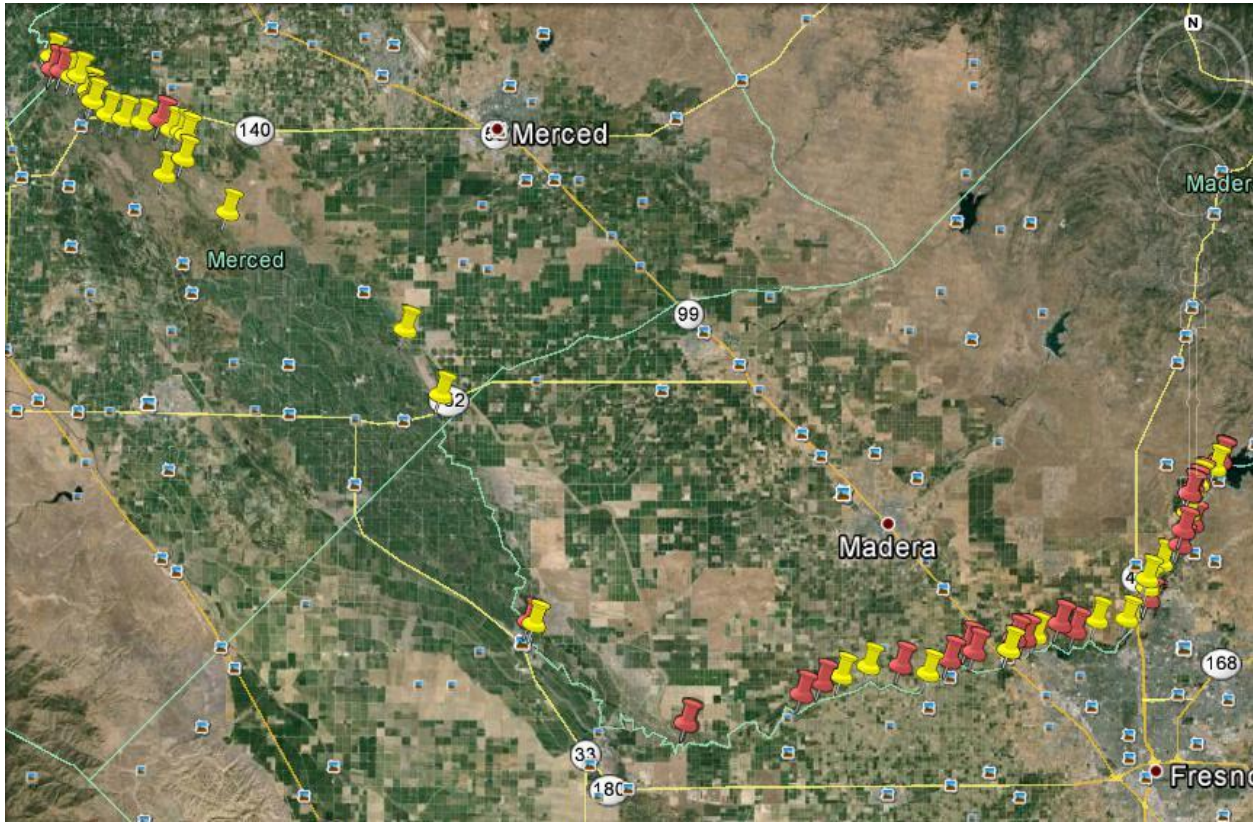


Figure 2. USFWS Fish Assemblage Sampling Sites in the San Joaquin River Restoration Area (sample Sites red= backpack electrofishing yellow=seine)

Data Summary

All data were entered into Excel, proofed and analyzed in that program. The number of samples varied during the course of the study, gaining sites as we acquired more river access and dropping sites that could be represented by other sample site data effectively. The high number of samples in October 2012 is due to boat electrofishing in the main river channel by the CDFW and USBR (Table 1). During the 2012 and 2013 sampling 38 fish species were captured (Table 2).

Table 1. The number of locations sampled within each reach of the San Joaquin River Restoration Area, May 2012-June 2013

Sample Sites By Reach and Month					
	May 2012	Oct. 2012	Jan. 2013	April 2013	June 2013
Reach 1	30	43	33	32	33
Reach 2	4	8	6	6	6
Reach 3	0	2	2	2	2
Reach 4	1	10	7	7	9
Reach 5	12	5	16	16	16

Table 2. Species captured by USFWS crews during fish assemblage sampling in the San Joaquin River Restoration Area, May 2012-June 2013.

Native	Non-Native
Hard head	Black Bullhead
Hitch	Black crappie
Kern River lamprey	Bluegill
Pacific lamprey	Brook Trout
Prickly Sculpin	Brown Bullhead
Rainbow Trout	Bigscale Logperch
River Lamprey	Common Carp
Sacramento Blackfish	Channel Catfish
Sacramento Pikeminnow	Fathead Minnow
Sacramento Sucker	Gambusia
Tule Perch	Goldfish
Three spine Stickleback	Golden Shiner
	Green Sunfish
	Inland Silverside
	largemouth Bass
	Pumpkinseed
	Redeye Bass
	Redear Sunfish
	Red Shiner
	Shimofuri Goby
	Spotted Bass
	Striped Bass
	Threadfin Shad
	White Catfish
	White Crappie
	Warmouth

Results

Results items will be addressed in future reporting efforts. Anticipated analysis includes fish assemblage composition by habitat type, reach and season. Additionally keystone species (key predators, natives, other species of interest) will be summarized to size distribution and abundance by habitat, reach and season.

Discussion

Discussion items will be addressed in future reporting efforts.

Conclusions

Conclusions and Recommendations will be made in future reporting efforts.

Principle Investigators Contact Information

Michelle Workman, michelle_workman@fws.gov

Don Portz, dportz@usbr.gov

This page left blank intentionally.