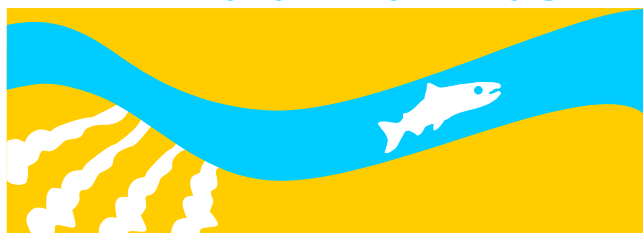


Appendix C

Restoration Administrator Recommendations and SJRRP Monitoring and Analysis

Final 2011 Agency Plan

SAN JOAQUIN RIVER
RESTORATION PROGRAM



- *Identify relationships between Friant Dam release flows and physical habitat characteristics (water depth, wetted cross section, water velocity, etc.) within Reach 1A related to adult salmonid holding, spawning, and juvenile rearing habitat;*
 - Appendix G, 2009 ATR: Meso-habitat surveys
 - Study, Section 10.0, Appendix A: Surface water Profile Surveys and Discharge Measurements
 - Study, Section 21.0, Appendix A: Floodplain Inundation (2D modeling)
- *Identifying relationships between Friant Dam flow release magnitude, local flow magnitude, and inundated floodplain area to serve as an index of fry and juvenile salmon rearing habitat;*
 - Study, Section 10.0, Appendix A: Surface water Profile Surveys and Discharge Measurements
 - Study, Section 12.0, Appendix A: Effects of San Mobilization on High-Flow Water Surface Elevations
 - Study, Section 21.0, Appendix A: Floodplain Inundation
 - Inundation maps based on waterlines identified from aerials to be completed for Final 2010 ATR
 - Steady hydraulic modeling and inundation mapping for 18 flow rates between 50 and 4500 cfs to be completed for Final 2010 ATR
- *Evaluating Exhibit B flow accretion and loss assumptions in Reach 1-4 by releasing various flow benches of sufficient duration to establish a hydraulic equilibrium between surface water and shallow groundwater at levels that do not impact adjacent agricultural operations;*
 - Study, Section 2.0, Appendix A: Historical and Water Year Flow Gage Record Analysis
- *Documenting seepage locations and shallow groundwater elevations during sustained river flows, primarily in Reaches 2, 3, and 4;*
 - Draft 1 2010 ATR Appendix E- site visits in response to seepage hotline calls, weekly groundwater reports
 - Study, Section 8.0, Appendix A: Flow Restrictions Due to Seasonal Groundwater Conditions
- *Documenting flow magnitude and timing in Reaches 1-5 as higher Interim Flows (and flood control releases, if they occur) route downstream, as well as provide field observations to validate the HEC-RAS unsteady flow model;*
 - Study, Section 3.0, Appendix A: Flow Travel Time from Friant Dam and Tributaries to Gravelly Ford
- *Developing information on the relationship between river flow and water depths within the main river channel related to adult and juvenile salmon passage, and identification of flow thresholds that would be expected to avoid migration impediments and delays in passage;*

- Study, Section 21.0, Appendix A: Floodplain Inundation (bathymetric surveys for 2D modeling)
- Study, Section 25.0, Appendix A: Adult Passage Study
- *Monitoring sand transport rates in Reach 1 to begin evaluating flow release thresholds for sand movement, and relate flow release magnitude with sand transport rates*
 - Study, Section 13.0, Appendix A: Sand Storage in Reach 1
 - USGS suspended sediment and bedload monitoring.
- *Evaluating coarse sediment (gravel/cobble) transport thresholds and rates in Reach 1 if flood control releases occur by using a combination of tracer rocks and bedload transport measures*
 - Study, Section 17.0, Appendix A: Reach 1A Spawning Area Bed Mobility
- *Documenting water temperatures in Reaches 1-5 to relate to flow release magnitude and meteorological conditions, as well as to provide field observations to validate model-predicted relationships between river flow and water temperature.*
 - Study, Section 28.0, Appendix A: Temperature Modeling - HEC-5Q to be validated with monitoring data prior to modeling potential WY 2011 hydrographs

Other important information gathering objectives include the following:

- *Documenting water temperatures within the Friant-Kern Canal and at multiple levels within Millerton Lake (throughout the year) to calibrate and validate model predictions of the water temperature simulation that links the thermal dynamics of the reservoir with the dynamics of the downstream river reaches;*
 - Study, Section 15.0, Appendix A: Temperature Monitoring for Millerton Cold Water Pool
 - Study currently inactive: Millerton Reservoir Temperature Modeling
- *Evaluating the response of native and non-native fishes and changes in their habitat and distribution in response to changes in river flows;*
 - Fisheries Management Plan. Integration into ATR in progress.
- *Improving understanding of high flow recession ramping rates and potential juvenile salmon stranding risk by evaluating stage and changes in wetted channel width as a function of flow in Reach 1;*
 - Hydraulic modeling
- *Evaluating thermal dynamics and potential effects on habitat suitability for salmonids and predator dynamics by monitoring water temperature diversity and hydraulic mixing within captured or instream gravel pits;*
 - Expansion of temperature monitoring network in gravel pits
 - 2D Temperature Modeling