

AFRP- Annual Workplan 2000

*Initial Scope of Work to:*

**Evaluate proposed non-structural flood control management alternatives on the San Joaquin River National Wildlife Refuge**

**PROPOSED AFRP CONTRIBUTION: ~\$ 75,000**

*An Initial Scope of Work Submitted by:*

**The Anadromous Fish Restoration Program in cooperation with the SJRNWR**

## **I SCOPE OF THE PROJECT**

**Project description:** The San Joaquin River National Wildlife Refuge (SJRNR) in cooperation with the US Army Corps of Engineers (COE) is currently evaluating non-structural flood management alternatives (NSA) that include breaching existing levees on newly acquired refuge land to protect and restore wetland and riparian habitat. This proposed NSA will provide floodplain inundation behind project levees of up to 3,100 acres of newly acquired refuge land in some years. The focus of the NSA study has been to identify potential levee breach sites and evaluate potential flooding risk to adjacent landowners. The evaluation discussed in this SOW will take the next step to evaluate the potential to maximize fisheries benefits and identify potential impacts of the current NSA alternative and help to shape refinement of this alternative to maximize benefits to anadromous fish and native resident fish species.

This project will build on the technical studies and NSA alternative development that has occurred to date. This includes the COE NSA analysis, and floodplain contour information generated by the COE Sacramento/San Joaquin Comprehensive Study process. The evaluation and monitoring study will help the SJRNR to identify and design the optimal combination of management and infrastructure modifications that will help to meet flood control and avian wildlife objectives while at the same time maximize benefits to juvenile salmon and steelhead and other native fish species.

**Project location:** The SJRNR is located on the San Joaquin River between the confluence of the two largest salmon producing tributaries in the San Joaquin which are the Tuolumne and the Stanislaus rivers, approximately 9 miles west of the city of Modesto. The levee breach sites are located on the San Joaquin River from approximately river mile (RM) 79 to RM 86. The SJRNR is in the process of expanding their boundary from 10,295 acres to nearly 13,000 acres and are just now in the process of developing a Comprehensive Conservation Plan (CCP). Providing additional information on the potential fish benefits of proposed management strategies will help inform the CCP process.

**The primary biological/ecological objectives:** Improve rearing conditions for juvenile salmonids (fall-run chinook salmon and steelhead), reduce the potential for stranding of these fish species, and to enhance San Joaquin River foodweb productivity.

**Project approach and tasks:** The project consists of three basic elements that include an alternatives analysis, design recommendations, and baseline monitoring.

**Task 1:** Engineering analysis to evaluate frequency, duration, and location of floodplain inundation to predict potential benefits and impacts to anadromous fish. This will include a compilation of existing hydraulic survey and hydrology information. A starting point will be the existing proposed NSA that the COE and Refuge staff have cooperated on. Additional potential breach and floodplain contour modification alternatives may be evaluated.

Estimated cost: \$25,000

Deliverable: Scoping summary report

**Task 2:** Project design recommendations. This will incorporate information from the engineering analysis in combination with management objectives of the SJRNWR. The desired outcome will be floodplain management recommendations and manipulations that could potentially be implemented in the context of the NSA alternative. This will also provide the basis for generating a proposal for future modification or manipulation of the levee and floodplain system.

Estimated cost: \$25,000

Deliverable: Final report that includes a summary of the hydraulic evaluations and alternative assessments and recommends one or more potential levee and floodplain modifications to address both flood protection and ecological objectives.

**Task 3:** Baseline monitoring. Provide funding to evaluate fish habitat use, growth, and potential stranding of the expanded floodplain on the SJRNWR. A team of ecologists and biologists would assemble the pilot monitoring strategy to evaluate potential fish use, benefit and impact of floodplain inundation.

Estimated cost: \$25,000 for one year

Deliverable: Monitoring report

**Participants and collaborators:** This initial Scope of Work was prepared by the AFRP after discussion with the SJRNWR. The AFRP will work with the SJRNWR to develop the final SOW. If the project is funded the SJRNWR would be responsible for project management and selection of an appropriate consultant to do the linked engineering and biological evaluations. The SJRNWR has also established a community forum with local landowners to exchange information on potential refuge management and issues of mutual interest. This project could potentially be coordinated with this group.

**II JUSTIFICATION FOR THE PROJECT:** Among the more important aspects of stream restoration is the maintenance of the terrestrial and aquatic interface through the restoration of shallow water habitat, the loss of which has been listed as the cause of population declines for several native species including Chinook salmon, Delta smelt, and splittail. Increased food availability and growth rates of river fish is a feature of many riverine systems where seasonal inundation of the floodplain still operates (Schlosser 1991). Increased availability of organic matter and invertebrates during floods, along with the expansion of the physical habitat, results in increased food intake and growth rate and improved condition for most river fish that associate with seasonally flooded floodplain habitats (Schlosser 1991). The importance of shallow water habitat to the overall health of the Sacramento- San Joaquin basin has only recently been considered and its' preservation and creation is presently the focus of many state, federal, and private organizations.

Recent studies in Yolo and Sutter bypasses and the lower Cosumnes River suggest that inundation of large floodplain habitats, similar to what is currently proposed for the SJRNWR can have substantial benefits to many native fish species including juvenile chinook salmon and Sacramento splittail. Data from 1997 and 1998 Yolo Bypass evaluations have been interpreted to

suggest that juvenile salmon grow faster in the Bypass floodplain than in the mainstem rivers due to warmer water temperatures and an abundant food supply. Initial results from 1998 studies also indicate that survival rates for salmon reared in the Bypass are higher than for individuals from the adjacent Sacramento River. Also, seasonal inundation of floodplain areas was historically one of the major processes that supported the Bay-Delta ecosystem. However, construction of dams and levees has reduced the connectivity of floodplains with the rivers. Seasonal inundation of the SJRNWR floodplain habitat will help to re-establish this link and associated processes that native fish species have adapted.

To date no serious effort to expand the San Joaquin River floodplain for the benefit of native fishes has been explored. However, the proximity of the SJRNWR to salmon-producing tributaries is such that all juvenile salmonids produced in the Tuolumne and Merced rivers pass through riverine habitat of the SJRNWR. Improved floodplain habitat could provide additional beneficial rearing and growth opportunities in a mainstem system with very little remaining physical habitat diversity. Development and implementation of a NSA that considers fish benefits provides a unique opportunity to the SJRNWR to cooperate with other fish management interests in planning mainstem habitat improvements to benefit the native fish fauna.

**Compatibility with AFRP restoration objectives:** This project supports San Joaquin River Evaluation 2: A) identify and implement actions to improve watershed management to restore and protect instream and riparian habitat @ in the Revised Draft Restoration Plan for the AFRP.

### **III MONITORING AND DATA EVALUATION**

Specific monitoring elements need to be identified.

### **IV WORK TO BE PERFORMED AND DELIVERABLES**

See summary in project description

### **V BUDGET**

The total cost for this project is only roughly estimated at this time. The steps that remain is to identify a consultant with the appropriate background to help further develop and execute the tasks outlined above. At this time it is estimated that it would cost around **\$75,000**.

It is also estimated that once a consultant is identified it will take up to two year for completion of the evaluation