

fish passage improvement plans if they do not unduly interfere with other existing or planned functions of the Yolo Bypass Wildlife Area.

A Yolo Bypass Interagency Working Group (YBIWG) has been formed which will develop priorities for fisheries projects within the Yolo Bypass. This group includes representatives from National Oceanic and Atmospheric Administration, national marine Fisheries Service (NMFS), DWR, DFG, and USFWS. The agreed upon prioritized fishery opportunities have been developed are included in the following document:

YOLO BYPASS CONCEPTUAL AQUATIC RESTORATION OPPORTUNITIES

The following describes potential northern Yolo Bypass (above Little Holland Tract) aquatic restoration opportunities. The CALFED Ecosystem Restoration Program Implementing Agencies (DFG, USFWS, NMFS) in cooperation with the DWR, are evaluating the feasibility of implementing the following opportunities. These opportunities were developed through consultations with participating agencies of the Yolo Bypass Interagency Working Group. The YBIWG acknowledges key issues, interests, and concerns raised during previous discussions with stakeholders and evaluates potential restoration opportunities with these issues in mind.

The primary goal of the YBIWG is to improve conditions for native fish species (particularly State and federal Threatened and Endangered fish species and species of special concern) in the Yolo Bypass, thereby enhancing populations and recovery efforts while minimizing land management impact.

This document focuses, at a conceptual level, on the sequential development of potential restoration opportunities in the northern Yolo Bypass. The set of potential restoration opportunities is provided to foster discussion among public entities and stakeholders interested in the northern Yolo Bypass.

The YBIWG has identified the following potential restoration opportunities for further evaluation:

- ▶ **Putah Creek** – Lower Putah Creek stream realignment and floodplain restoration for fish passage improvement and multi-species habitat development on existing public lands.
- ▶ **Lisbon Weir** – Improve agriculture and habitat water control structure for fish and wildlife benefits.
- ▶ **Additional multi-species habitat development** – Identify areas of opportunity within the Yolo Bypass Wildlife Area, or other appropriate areas that could provide for controlled localized seasonal inundation on more frequent intervals.
- ▶ **Tule Canal Connectivity** – Identify passage impediments. Evaluate the feasibility of improving fish passage or removing fish passage impediments.
- ▶ **Multi-species fish passage structure** – Evaluate the feasibility of constructing a multi-species fish passage structure at the Fremont Weir.

Biological monitoring will be implemented as necessary and may be used to guide future actions and adaptive management.

Multi-species restoration opportunities discussed here are presented in a sequential order of completion. For the full value of the proposed restoration opportunities in the Yolo Bypass to be realized, the following ordered scheme should occur.

Step 1 – Putah Creek

Evaluate and develop a plan for the realignment and restoration of lower Putah Creek. The area proposed for restoration is within existing public lands. The realignment has the potential to create 130 to 300 acres of shallow

water habitat. Benefits would include improved salmonid immigration and emigration to and from Putah Creek, an increase in avian (shorebird and waterfowl) habitat, increased aquatic and riparian habitat for other native species, as well as a significant enhancement to existing fish habitat in and around Putah Creek. Any potential actions would be consistent and coordinated with the Putah Creek Water Accord.

Goals:

- ▶ Improve passage, rearing, and emigration of adult and juvenile salmon and steelhead in Putah Creek
- ▶ Provide diverse aquatic and riparian habitats for shorebirds, ground nesting birds, waterfowl, plants, invertebrates, plankton, and spawning and rearing of native fish species

Step 2 – Lisbon Weir

Modify or replace Lisbon Weir to provide better fisheries management opportunities in Putah Creek and the Toe Drain, while improving the reliability of agricultural diversions and reducing maintenance requirements. A conceptual example of the synergistic benefits of these proposed restoration actions is the idea that improving Lisbon Weir's reliability for agricultural diversions could increase flexibility in water distribution, thereby allowing for greater attraction flows to be released down the realigned Putah Creek.

Goals:

- ▶ Improve irrigation water distribution system to benefit fish and wildlife
- ▶ Improve likelihood of adult fall-run Chinook immigration to Putah Creek
- ▶ Reduce delay and possible stranding of adult steelhead, Chinook salmon and sturgeon, when passable conditions to the Sacramento River exist
- ▶ Reduce delay of juvenile salmonid emigration within the Toe Drain

Step 3 – Additional multi-species habitat development

Expand existing shallow water habitat for various species including juvenile native fish. Additional multi-species habitat could be developed through the excavation of a low shelf along a limited portion of the Toe Drain and through small scale setback levees, or by other unidentified means. Restoration opportunities for the development of additional seasonal shallow water habitat, where opportunities exist, may occur on: 1) undeveloped lands within the Yolo Bypass Wildlife Area; 2) other undeveloped public lands within the Yolo Bypass; and 3) private lands where cooperative agreements between the implementing agencies and the landowners provides mutual benefits.

Goals:

- ▶ Increase rearing habitat available to juvenile steelhead, Chinook salmon, and splittail
- ▶ Increase shallow water habitat availability for multiple species (fish, wildlife, plankton, and others)

Step 4 – Tule Canal connectivity

Identify areas of stranding adjacent to the Fremont Weir. Evaluate the feasibility of improving connectivity between the Fremont Weir, the Fremont Weir scour ponds, and the Toe Drain to reduce stranding of adult and juvenile fish. Identify seasonal road crossings and agricultural impoundments in the northern Yolo Bypass that

impact wetted habitat connectivity, immigration, and emigration of fish species utilizing the Yolo Bypass. Develop conceptual approaches for the modification of crossings and impoundments.

Goals:

- ▶ Reduce delay and stranding of adult steelhead, Chinook salmon, and sturgeon immigrating within the Yolo Bypass
- ▶ Reduce delay and overall losses of juvenile Chinook salmon and steelhead emigrating within the Yolo Bypass

Step 5 – Multi-species fish passage

Evaluate the feasibility and appropriateness of providing fish passage improvements in and along the Fremont Weir. Appropriate operational constraints would guide plan development and would ensure: 1) continued maintenance of flood conveyance capacity; 2) no substantial changes in timing, volume, and/or duration flow; and 3) minimal disturbance to existing land use and agricultural practices.

Restoration opportunities may include the addition of a new, controlled multi-species fish passage structure at the eastern edge of the Fremont Weir. Additionally, restoration opportunities may include improvements along the existing weir face and apron to facilitate sturgeon passage along the length of Fremont Weir without introducing any additional flows. Conceptual designs for this option could include rock ramps that would provide a gradual slope up the face of the weir. In addition to the installation of new fish passage structures, the existing fish ladder will be analyzed to determine if modifications could allow for a greater range of fish species passage.

Goals:

- ▶ When present in the northern Yolo Bypass, improve immigration and emigration (reduce delay and stranding) of adult and juvenile fish (steelhead, Chinook salmon, and sturgeon).

The YBIWG identified potential restoration opportunities with consideration given to the elimination or minimization of potential negative impacts to the following areas of concern:

- ▶ Flood control
- ▶ Agricultural operations
- ▶ State and federal wildlife area infrastructure investments
- ▶ Public and private waterfowl management operations
- ▶ Wildlife management operations
- ▶ Water quality
- ▶ Educational activities
- ▶ Recreation
- ▶ Vector control
- ▶ Welfare of selected fish species at various life stages.

The intent of the YBIWG is to keep all users and interest whole. Conceptual restoration opportunities were developed to be implemented with minimal impact to Yolo Bypass users. Restoration opportunities that significantly changed the timing and/or duration of flow, or that resulted in substantial new regulation of the Yolo Bypass, were eliminated from further consideration.

