

8.0 FISH PLAN IMPLEMENTATION STRATEGY

This chapter describes the manner in which the FWG envisions that the FISH Plan would be carried out. In essence, the FISH Plan articulates a broadly shared understanding regarding the management and restoration actions that are most important to undertake to improve conditions for fall-run chinook salmon, steelhead, and splittail in the lower American River. The FISH Plan is intended to provide a cohesive framework that can: (1) serve as a locus around which public and private entities working in the lower American River can voluntarily coordinate their efforts to responsibly steward lower American River fish and aquatic habitat; and (2) assist funding entities in assessing where habitat enhancement funds might most effectively be invested. However, individual fisheries and aquatic habitat enhancement actions, as well as associated statutory and regulatory compliance requirements, will remain the responsibility of individual project proponents. The FISH Plan is not intended to alter agencies' existing rights or responsibilities (e.g., with regard to policy and fiscal decision-making).

1.1. ADMINISTRATIVE ARRANGEMENTS TO SUPPORT IMPLEMENTATION

Because the FISH Plan will advance many agencies' compatible missions and is being integrated into the LAR Task Force's broader RCMP, the FWG anticipates that the LAR Task Force will be a functional venue through which to coordinate its implementation. This expectation is based on the FISH Working Group continuing to meet, albeit less frequently (perhaps 2 to 4 times per year), to oversee implementation of the FISH Plan (and the analogous portions of the RCMP). This expectation also assumes that the FWG's Technical Subcommittee continues to meet (perhaps 6 to 8 times per year) to guide implementation of these plans in a "hands-on" manner, reviewing monitoring data and developing adaptive management recommendations. It is anticipated that the American River Operations Group (AROG) will continue to meet on a monthly basis to discuss more detailed operational decisions related to lower American River management, but that the efforts of the AROG, TSC, FWG, and LAR Task Force will be complementary to one another.

As FISH Plan and RCMP implementation get underway, the LAR Task Force and its working groups will need to focus on how to implement the recommendations in each of those documents. Some of the recommendations have been initiated already and need little FWG/TSC assistance, while others are at the conceptual stage and will require substantial leadership, guidance, and financial support to bring them to fruition. With this in mind, the FWG and TSC will need to determine which of the recommendations to focus on first, and the most appropriate manner in which to assist project proponents to achieve results that are consistent with FISH Plan goals and objectives (see Section 8.6 for related discussion.)

The Initial FISH Plan is intended to be a living document, in keeping with its adaptive management orientation. The FWG/TSC anticipates that a periodic review of FISH Plan implementation results will be undertaken, generating recommendations regarding adjustments to FISH Plan goals, objectives, conceptual models, recommended actions, priorities, and monitoring provisions. Annual reporting of FISH Plan implementation will be a part of the State of the River Report to be produced by the Water Forum. Throughout the year, the FWG/TSC anticipates:

- Undertaking proactive action planning (including proposal planning) for FISH Plan implementation;
- Providing project-specific feedback on FISH Plan-recommended actions and related projects. Subsets of the FWG/TSC may work together on implementation of FISH Plan recommendations and facilitating associated permitting processes where appropriate;
- Reviewing results and information derived from implementation of FISH Plan recommendations, related projects, and the river-wide monitoring plan;
- Reviewing and commending on drafts of the annual State of the River Report; and
- Interfacing with related initiatives, such as CalFed and other programs.

Should new fisheries and in-stream habitat enhancement opportunities arise, or time-sensitive opportunities to advance second or third priority FISH Plan recommendations, the FWG/TSC is receptive to discussing them as long as first priority FISH Plan recommendations receive their primary focus. The FWG/TSC will make written information available to help project proponents understand the FWG/TSC's functions and how best to avail themselves of opportunities to obtain FWG/TSC feedback on lower American River fisheries and aquatic habitat restoration initiatives.

1.2. LEAD AGENCIES' ROLES AND RESPONSIBILITIES

Table 8-1 indicates which organizations would probably need to play key roles in implementing each of the fisheries and aquatic habitat enhancement actions recommended in Chapter 6 (see Column 1).

For those actions where one particular agency clearly would be the appropriate lead agency, that agency's name is underlined (In some cases, it seems appropriate that two or three agencies share the lead.) The fact that an agency is listed in this column reflects the collective perceptions of the FISH Working Group regarding which agencies would have a critical contribution to make towards implementation. However, being listed in this column does not indicate that an agency has agreed to participate in implementing the action, to take the lead in doing so, or to fund implementation of the recommended action.

1.3. POTENTIAL FUNDING SOURCES

Potential sources of funding for each action are shown in Column 2 of Table 8-1. Again, because an agency or program is listed as a potential source of funding does not mean that that entity has been asked to fund the action in question, nor that it has agreed to do so. The information in Table 8-1 (Column 2) simply reflects the FISH Working Group's ideas about where to begin the effort to obtain funding for the relevant action.

Table 8-1. FISH Plan Recommendations: Implementation Considerations.

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
FIRST PRIORITY RECOMMENDATIONS					
Lower American River Flow/Temperature Regime					
1. Develop and implement an ecologically-based flow management plan for the lower American River, including water temperature management considerations, subject to SWRCB approval.	Water Forum, BAARFS ³ , SWRCB, USBR, AROG, City of Sacramento	WFSE, USBR, CalFed, Corps, City of Sacramento	Development		
			\$1,000,000 to formulate proposal to SWRCB on updated flow management plan (not including implementation, which is to be determined).	Plan development has been initiated. Complete within 2 years.	Partially funded. Approximately \$600,000 spent or obligated by City of Sacramento for development of one component (updated flow management plan). This component also has received @ 500 hours of USBR in-kind professional support, @ 170 professional hours of in-kind support per month from AROG member agencies and 30 hours per month from BAARFS member agencies. An additional \$50,000-\$100,000 is needed to complete this component. ⁴
			Implementation, Monitoring, Operations, and Maintenance		
			TBD ⁵	TBD	Needed.
2. Develop and implement a comprehensive water temperature monitoring plan for the lower American River.	USBR, CDFG, City of Sacramento, USFWS, NMFS, EID, Water Forum	CalFed, City of Sacramento ⁶ , SAFCA ⁷ , USBR, Water Forum	Development		
			Over \$1 million for development of comprehensive plan.	Initial steps are underway.	Partially funded by USBR as a component of the function analysis workshop to develop the plan. USBR also has invested @ \$195,000 in installation of temperature monitoring equipment in Folsom Reservoir, Lake Natoma, and the lower American River.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	Implement on an ongoing basis. Update plan periodically.	Needed. (USBR spends @\$75,000/year maintaining temperature monitoring stations on the upper and lower American River, and Folsom and Nimbus Reservoirs).

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
3. Develop and implement physical actions and operational and management measures to improve water temperatures in the lower American River.	USBR, CDFG, City of Sacramento, USFWS, NMFS, EID, Water Forum, SAFCA	CalFed, City of Sacramento ⁶ , SAFCA ⁷ , USBR, Water Forum	Development		
			TBD	Initial steps are underway.	USBR has invested \$2.5 million in design & construction of a TCD for the Folsom Dam M&I intake, \$200,000 for the design of a TCD for the EID intake. USBR also spent \$100,000 on a value analysis study of lower American River temperature issues, \$50,000 on development of related strategies for evaluating study results, and \$15,000 for bathymetric surveys of Lake Natoma. ⁴
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	Implement on an ongoing basis. Update plan periodically.	Needed. (USBR spends @ \$41,000/year on maintaining temperature monitoring equipment in Folsom Reservoir, Lake Natoma, and the lower American River.)
Aquatic, Riparian, and Wetland Habitat					
4. Develop a plan or policy for management of large woody debris in the lower American River, consistent with recreation safety needs, including a pilot project.	County of Sacramento (development); Corps, Reclamation Board, CDFG, SAFCA, LAR Task Force, Water Forum (implementation), State Lands Commission	SAFCA, Water Forum, Trout Unlimited, Fish America Foundation, National Fish & Wildlife Foundation, AFRP, Corps	Development		
			\$100,000 for plan development	Plan development has been initiated. Completion could take 6 months to 3 years.	Needed. (SAFCA has spent \$78,000 on the development of planning criteria for woody materials improvements associated with bank protection projects.)
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	Initiate pilot within 3 to 5 years.	Needed.
			\$100,00 to \$500,000 for evaluation	Initiate evaluation within 1 to 3 years. Complete within 1 to 2 years of start-up.	Needed.
Implementation, Monitoring, Operations, and Maintenance					
TBD	If results of evaluation support implementation, implement within 3 to 5 years.	Needed.			

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
Levees and Bank Protection					
5. Identify and evaluate locations in the Lower American River where existing revetments could be modified to incorporate bank protection habitat features to aid in preservation and re-establishment of both high-quality nearshore aquatic and riparian habitats, and implement measures where appropriate and possible to do so without having an impact on the integrity of the bank protection.	Corps, Reclamation Board, SAFCA, ARFCD, USFWS, CDFG, NMFS, Water Forum, State Lands Commission	Corps, Reclamation Board, SAFCA, CalFed, Water Forum, Mitigation Funds, Extra-Mural Grants	Development		
			\$50,000 to \$500,000 to identify locations	Initiate within 1 to 3 years. Complete location inventory within 1 to 2 years of start-up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	Implementation will be ongoing.	Needed.			
Artificial Propagation of Fish					
6. Estimate relative proportion of hatchery and naturally produced chinook and steelhead to annual spawning escapement and commercial and sports fisheries to enhance management capabilities.	CDFG, USFWS, NMFS, USBR	CDFG/General Fund, CalFed, USBR, AFRP	Development		
			\$50,000 to \$500,000	Complete within 1 to 3 years.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	May need to be done annually.	Needed.			
7. Undertake long-term modification of the diversion structure at the Nimbus Salmon and Steelhead Hatchery to protect salmon and steelhead and other lower American River resources from potential impacts associated with flow fluctuations for operations and maintenance.	CDFG, USBR	CDFG, CalFed, USBR, Corps	Development		
			\$1 to 5 million	Design is underway.	USBR has obligated \$350,000 for design of structure, including prototype, & construction of prototype
			Implementation, Monitoring, Operations, and Maintenance		
\$5 million for construction beyond prototype	Expected to be completed in 2003.	Needed.			
Stranding					
8. Complete the inventory of areas that pose a stranding threat to juvenile salmonids. Conduct a function analysis workshop to identify measures to reduce or eliminate stranding. Implement measures where appropriate opportunities exist.	CDFG, NMFS, USFWS, Water Forum, USBR, Corps, SAFCA	Corps, USBR, Reclamation Board, SAFCA, CalFed, CVPIA, Water Forum, AFRP, Extra-Mural Grants	Development		
			Under \$1 million for inventory, V.A. workshop, and pilot	Complete inventory within 2 years.	Partially funded, with \$245,000 obligated to CDFG from USBR/CVPIA funds.
			Implementation, Monitoring, Operations, and Maintenance		
Millions of dollars.	Remedial measures likely to take 2 to 5 years.	Needed.			

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
Other Potential Management Actions					
9. Identify the fishery impacts on lower American River priority species caused by meeting Sacramento/San Joaquin Delta WQCP requirements and needs from Folsom Reservoir.	USBR, USFWS, AROG, CDFG, NMFS, Water Forum	Water Forum, CalFed, USBR, Extra-Mural Grants, In-Kind Service	Development		
			\$5,000 to \$50,000 through initial presentation.	Complete within 1 to 3 years.	Needed. (Water Forum has spent approximately 2 days of in-kind support on this as of June, 2001.)
			Implementation, Monitoring, Operations, and Maintenance		
TBD	Ongoing.	Needed.			
10. Improve availability and management of lower American River research data, with attention to quality control.	USBR, CDFG (biological data), USFWS/CAMP, IEP, USGS (physical data), CalFed Science Board, Water Forum (catalyst)	CDFG, Water Forum, SAFCA, CVPIA, National Fish & Wildlife Foundation, AFRP, FWG, RCMP Science Program	Development		
			\$50,000 to \$500,000 initial investment	Initiate within 1 to 3 years. Complete initial effort within 12 to 18 months of start up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
Approximately \$30,000/year on ongoing basis.	Should be ongoing.	Needed.			
Monitoring and Evaluation Components					
A. To improve management capabilities, determine the relative contribution of fall-run chinook salmon that leave the lower American River early as post emergent fry to the lower American River spawning stock escapement.	CDFG, NMFS, USFWS	CalFed, CVPIA, Water Forum, AFRP/IEP	Development		
			\$65,000 to \$500,000	Initiate within 1 to 3 years. Initial determination done within 18 months after start-up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	Should be ongoing.	Needed.			
B. Investigate temporal and spatial distribution of steelhead in the lower American River to strengthen the information base for management decisions.	CDFG, NMFS, USFWS	CalFed, CDFG, CVPIA/USBR, AFRP, NMFS	Development		
			\$20,000 to \$48,000	Underway. Complete initial investigation within 10 to 24 months.	Funded.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	Should be ongoing.	Needed.			
C. Use best available information (or develop new information as needed) to cost-effectively create a multi-point lower American River water temperature predicting and estimating model with shorter timesteps to strengthen adaptive management capabilities.	USBR, Water Forum, NMFS, SAFCA (re: long-term re-op)	USBR, CalFed, Water Forum, FWG, CVPIA, SAFCA	Development		
			\$500,000	Initiate within 1 to 3 years. Likely to take 1 to 5 years to complete model.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	May need to be ongoing.	Needed.			

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
SECOND PRIORITY RECOMMENDATIONS					
Aquatic, Riparian and Wetland Habitat					
11. Identify and evaluate opportunities to implement Wetland/Slough Complex restoration, with needs of all priority species in mind.	CDFG, <u>USFWS/AFRP</u> , Water Forum, Corps, State Lands Commission	Corps, CalFed, USBR, AFRP, Other Grants	Development		
			\$100,000-\$500,000 for evaluation	Initiate evaluation within one year. Complete within 1-2 years of start-up	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	If results of evaluation support implementation, implement within 3-5 years.	Needed			
Natural Floodplain & Flood Processes					
12. Inventory locations for creating shallow inundated floodplain habitat for multi-species benefits, and implement where suitable opportunities are available. Protect existing overflow areas.	<u>SAFCA</u> (for pilot project), <u>Corps</u> , <u>USFWS</u> , CDFG, NMFS, Water Forum	Corps, SAFCA, Reclamation Board, CalFed, USFWS, Extra-Mural Grants	Development		
			\$500,000 to \$3 million	Initiate within 1 to 3 years. Complete inventory within 2 years of start up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	Implementation likely to take 1 to 5 years.	Needed			
13. Identify opportunities to, and potential benefits of, enhancing or constructing mainstem and side channel habitats that provide salmon and steelhead spawning and rearing habitat, and implement measures where suitable opportunities are available.	USFWS, CDFG, Water Forum, USBR, NMFS, <u>Corps</u> , State Lands Commission	Corps, USBR, CVPIA, CalFed, WFSE, Mitigation Funds, Extra-Mural Grants	Development		
			\$300,000 to 500,000 for inventory	Complete within 2 years.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
\$200 million	Implementation likely to require 3 to 5 years.	Needed.			
Harvest of Fish and Wildlife					
14. To assist in protecting and enhancing the natural production of lower American River salmonids, develop and implement a marking and selective harvest program for lower American River chinook salmon and steelhead, ideally in the context of a Central Valley-wide effort.	CDFG, USFWS, NMFS,	CDFG, CalFed, WFSE, CVPIA	Development		
			Depending on methods used, lower American River cost could range from \$500,000 (with otoliths) to millions (with coded wire tagging)	Initiate within 1 to 2 years. Complete within 2 years of start-up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD. Monitoring will be costly.	Should be ongoing.	Needed.			

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
Other Potential Management Actions					
15. Continue to provide ongoing long-term consultation/technical assistance to LAR Task Force, its component committees, and responsible agencies for lower American River management.	SAFCA, USBR, TSC, AROG, CDFG, DWR, USFWS, NMFS, Corps, Water Forum, SWRCB, State Lands Commission, water interests, environmental organizations	USBR, SAFCA, CalFed, Water Forum, In-Kind Services of TSC & AROG member agencies	Development		
			\$30,000 to \$100,000/year plus in-kind services	Underway.	Partially funded. At least \$300,000 spent or obligated for technical consultation through June, '01. ² Receives at least 50 hours of professional hours per month of in-kind support from TSC member agencies. ³
			Implementation, Monitoring, Operations, and Maintenance		
See above			Should be ongoing.	Partially funded.	
Coarse Sediment Supply					
16. Develop a collaborative program to investigate erosion, bedload movement, sediment transport, and depositional processes and their relationship to the formation and maintenance of fish habitat in the lower American River.	Corps, SAFCA, USBR, CDFG	Corps, SAFCA, CalFed, CVPIA	Development		
			\$50,000 to \$150,000 for sensitivity analysis of efforts to date. Up to \$500,000 for program development.	Initiate within 2 years. Complete within 1 year from start-up.	Partially funded.
			Implementation, Monitoring, Operations, and Maintenance		
TBD			May be ongoing.	Needed.	
17. Assess the need to develop a spawning gravel monitoring and management program for steelhead and fall-run chinook in which intervention would be based on identification of specific sites where intervention would enhance or increase salmonid spawning habitat.	CDFG, USFWS, USBR	CalFed, CDFG, Corps, USBR, CVPIA	Development		
			\$100,000	Initiate within 1 to 3 years. Complete within 18 months of start-up.	Partially funded (\$100,000 in USBR funds to CDFG for experimental program).
			Implementation, Monitoring, Operations, and Maintenance		
TBD			TBD	Needed.	
Artificial Propagation of Fish					
18. Evaluate Nimbus Salmon & Steelhead Hatchery production and stocking practices to identify measures that would promote restoration of native fish species in the lower American River.	CDFG, NMFS	CDFG, CalFed, Water Forum, USBR, Corps, USFWS, CVPIA/AFRP	Development		
			Depending on methods, costs could range from under \$100,000 to millions	Underway. Complete within 2 years of start-up. May need to be ongoing.	Partially funded.
			Implementation, Monitoring, Operations, and Maintenance		
TBD			TBD	Needed.	

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
Other Potential Restoration Actions					
19. Assess feasibility of providing enhanced off-site (e.g., Auburn Ravine, Coon Creek, Dry Creek) steelhead habitat.	USFWS, NMFS, CDFG	CDFG, CalFed, USBR, Corps, AFRP, National Fish & Wildlife Foundation, Mitigation Funds	Development		
			\$15,000 to \$100,000	Initiate within 1 to 3 years. Complete within 6 months of start-up.	Partially funded. USFWS/AFRP spent \$36,450 on an existing conditions report on Secret Ravine (a tributary of Dry Cr.) and \$40,000 to develop a watershed management plan for Dry Creek (a tributary of the lower American River) with steelhead and chinook salmon needs in mind.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	TBD	Needed.
Monitoring and Evaluation Components					
D. Develop and implement a method of estimating annual steelhead in-river spawning population and population trends to assist in management decision-making.	CDFG, NMFS, USBR	CDFG, Corps, USBR, Water Forum, CalFed, AFRP, NMFS, Fish America, Mitigation Funds	Development		
			Under \$100,000 to develop. \$12,000 to \$15,000/year.	Initiate within 1 to 3 years.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	Likely to take 4 months each year, although may not be possible in many years due to flows.	
E. Develop an in-river production model for fall-run chinook salmon to assist in understanding factors critical to the well being of this species.	CDFG, <u>USFWS</u>	NMFS, USFWS, Water Forum, CalFed, AFRP, CDFG	\$35,000 to \$500,000	Initiate within 3 years. Complete within 1 year of start-up.	Needed.
F. Develop a juvenile steelhead over-summer survival model to assist in understanding factors critical to the well-being of this species.	<u>CDFG</u> , NMFS	Water Forum, CalFed	\$100,000 to \$500,000	Initiate within 3 years.	Needed.
G. Develop a stock recruitment model for fall-run chinook salmon to guide management decision-making.	<u>CDFG</u>	Water Forum, CDFG, CalFed, AFRP	\$10,000	Initiate within 1 to 3 years. Complete within 6 months of start-up.	Needed.
THIRD PRIORITY RECOMMENDATIONS					
20. Identify and characterize the complexity and diversity of aquatic habitats in the lower American River, and implement measures where suitable opportunities are available.	<u>CDFG</u> , NMFS, USFWS	USBR, NMFS, USFWS, CDFG	Development		
			\$100,000 to 200,000	TBD	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	TBD	Needed.

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
Aquatic, Riparian, and Wetland Habitat					
21. Identify and evaluate suitable locations and benefits of establishing or providing SRA habitat along the lower American River to benefit priority fish species, and implement measures where appropriate opportunities exist.	SAFCA, Corps	Corps, SAFCA, USFWS	Development		
			\$100,000 to \$500,000	Some efforts underway but comprehensive effort should be initiated within 3 years.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	TBD	Needed.
22. Identify and evaluate suitable locations to use large in-stream objects (e.g., boulders) to modify flow dynamics to increase cover and diversity of in-stream habitat for priority fish species. Implement measures where suitable opportunities are available.	CDFG, NMFS, USFWS, Reclamation Board	Corps, CalFed, AFRP	Development		
			\$100,000 to \$300,000	Initiate within 1 to 3 years. Complete within 1 year of start-up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	TBD	Needed.
23. Identify and evaluate suitable locations to establish or provide wetland filtration habitat on inflow point source discharges; create such habitat if suitable opportunities can be identified.	Corps, Sacramento County Parks (for pilot project), SAFCA (for pilot project)	EPA, WFSE, Corps, County of Sacramento, Cal Expo, SAFCA (maintenance)	Development		
			Under \$500,000	Some related efforts underway. Initiate comprehensive inventory within 1 to 3 years.	Needed
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	TBD	Needed.
Contaminants					
24. Develop collaborative guidelines to reduce the application of toxins on lands that have the greatest risk to fish populations, where possible.	SAFCA, CDFG, Regional Board, Water Purveyors under Water Forum Agreement, Sacramento County Parks	EPA, Regional Board, SAFCA, County of Sacramento, Purveyors	Development		
			Under \$100,000	Should be ongoing.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	TBD	Needed.
Harvest of Fish & Wildlife					
25. To assist with management decision making, ascertain whether in-river illegal harvest of chinook salmon and steelhead is acting as a stressor on those species in the lower American River.	CDFG, NMFS	CDFG, CalFed, AFRP	Development		
			\$12,000 to \$100,000	Initiate within 1 to 3 years. Complete within 6 to 12 months of start-up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
			TBD	May need to be ongoing.	Needed.

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
Artificial Propagation of Fish					
26. Evaluate alternative ways for addressing temperature-related issues at the Nimbus and American River Fish Hatcheries which would not jeopardize the needs of in-stream spawning fall-run chinook salmon and steelhead.	CDFG	CDFG, USBR, Corps	Development		
			Under \$100,000	Initiate within 1 to 3 years.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	Implementation likely to require 3 to 5 years.	Needed.			
Other Potential Management Actions					
27. Coordinate the permitting process for lower American River restoration actions through the RCMP, where possible.	SAFCA, Corps, NMFS, USFWS, State Reclamation Board, CDFG, City and County of Sacramento, State Lands Commission	SAFCA, CalFed	Development		
			Under \$100,000	Initiate within 2 years. Ongoing	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	TBD	Needed.			
28. Conduct habitat suitability assessment for steelhead in the mile below Folsom Dam in Lake Natoma.	USFWS, NMFS, CDFG	USFWS, CalFed, USBR, Corps, CDFG, NMFS	Development		
			\$5,000 to \$100,000	Initiate within 2 years. Complete within 1 month of start-up.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
TBD	TBD	Needed.			
Monitoring and Evaluation Component					
H. Use existing aerial photographs as a baseline for monitoring activities requiring positional accuracy	SAFCA, CDFG, USFWS, USBR, Corps	Water Forum, CalFed, Corps, SAFCA	Development		
			Could range from \$100,000 to \$1,000,000	Initiate within 1 to 3 years. Complete within 2 years of start-up.	Needed
			Implementation, Monitoring, Operations, and Maintenance		
TBD	May need to be ongoing.	Needed.			
I. Evaluate efficacy of installing and operating a fish counting weir to improve estimates of: (a) spawning stock escapement; and (b) juvenile outmigrant population.	NMFS for (a), CDFG for (b), USFWS	CDFG, CalFed, USBR, Corps, FWG	Development		
			For (a) \$300,000 for construction. For (b), \$100,000 for construction assuming temporary weir (April to June only).	Initiate within 3 years.	Needed.
			Implementation, Monitoring, Operations, and Maintenance		
For operating (a), \$10,000 to 30,000/year For operating (b), \$10,000/year.	Ongoing.	Needed.			

Recommended action	1. Key agency(ies) ¹	2. Potential funding source(s)	3. Cost Estimate ²	4. Time frame	5. Funding status
<p>¹ Underlined terms in this column indicate which agencies would be likely to provide leadership for the effort. Others would also play key roles (acronyms are identified on page x.).</p> <p>² Cost estimates are approximate. Further analysis would be needed to verify and refine figures.</p> <p>³ BAARFS = Biological Assessment of American River Flow Standard Team. Convened by the Water Forum, members include NMFS, USFWS, CDFG, Corps, USBR, and City of Sacramento.</p> <p>⁴ This recommendation also benefits from the \$195,000 USBR spent on water temperature monitoring infrastructure and the \$41,000/year that USBR spends to maintain that infrastructure, as described in Recommendation #3.</p> <p>⁵ TBD = To be determined</p> <p>⁶ As mitigation for fish screen modifications on the Fairbairn Water Treatment Plant, the City of Sacramento has committed \$500,000 for lower American River temperature enhancements of a type to be determined.</p> <p>⁷ SAFCA has committed \$2 million for shutter modifications or other agreed-upon temperature improvements.</p>					

The funding sources mentioned in Table 8-1 (Column 2) may be augmented by extra-mural funding from private and public sources, as well as by mitigation funds. As mentioned above, the FISH Plan will be integrated into the LAR Task Force's broader RCMP. The RCMP action plan will receive a certain amount of support from a grant writer cooperatively funded and managed by SAFCA, the Water Forum, and the County and City Parks and Recreation Departments. The grantwriter is developing a fundraising strategy for six Sacramento-area riparian corridors, including the lower American River from the Nimbus Salmon and Steelhead Hatchery downstream to the Sacramento River. The FWG looks forward to working with the grantwriter and managing agencies to assist in securing funds that will help implement the FISH Plan and analogous portions of the RCMP.

1.4. COST ESTIMATES AND FUNDING STATUS

Column 3 of Table 8-1 displays cost estimates for each FISH Plan recommendation. Where appropriate, these cost estimates have been separated into costs associated with the "development" phase of the action and costs associated with the "implementation, monitoring, operations, and maintenance" phase of the action. (The FWG strongly believes that all lower American River fisheries and aquatic habitat enhancement actions should include monitoring components.) Column 5 indicates the funding status of the recommendation in question (e.g., "funded," "partially funded," or "funding needed"); this column also includes notes regarding the extent to which resources have been invested to date in beginning implementation of the recommendation or in related efforts.

1.5. TIMELINE FOR RESTORATION AND MANAGEMENT ACTIONS

The suggested timeline for implementing the fisheries and aquatic habitat enhancement actions recommended in Chapter 6 is specific to each recommended action (see Table 8-1, Column 4). As mentioned above, some of the recommended actions have already been initiated. Of these, some are expected to be completed within a year, while others are envisioned as activities that should be ongoing for the foreseeable future. However, most of the recommended actions are envisioned as being initiated within the next year and being wrapped up within 2 to 5 years.

1.6. TECHNICAL ASSISTANCE NEEDED TO DEVELOP, UPDATE, ADMINISTER AND IMPLEMENT THE PLAN AND MONITOR RESULTS

Development and implementation of measures to enhance conditions for steelhead, chinook salmon and other aquatic resources of the lower American River should be based on a fuller understanding of resource needs and restoration opportunities. The FWG envisions that on-going, long-term consultation and technical assistance provided by its Technical Subcommittee will continue to play a significant role in increasing this understanding as the FWG and TSC guide implementation of the FISH Plan.

As mentioned in Chapter 6, the FWG has recommended that technical assistance be used to improve the availability and management of lower American River research data, with attention

to quality control. Databases of lower American River water temperature data currently are available on the California Data Exchange Center (CDEC). However, additional water temperature data, as well as habitat characterization, biologic monitoring and operations information exists in various formats and resides with numerous entities and individuals. These databases need to be expanded, and associated quality control activities must be specified for each database. In addition, potential database users need to know what data are available, and where the data and quality control information are located.

In addition, consultation with fisheries and water resources experts will be necessary to identify and implement enhancement measures that will benefit steelhead, chinook salmon, and other aquatic resources in the lower American River. There must be management flexibility to allow for continued evaluation of the interaction among flow, temperature, and other restoration actions on target fish populations.

1.7. OVERCOMING POTENTIAL CHALLENGES TO IMPLEMENTATION

The FWG anticipates that there will, indeed, be challenges to overcome in implementing the FISH Plan and analogous portions of the RCMP. This section lists some of the challenges that may be encountered, as well as strategies for overcoming them.

8.1.1 NEED TO MORE FULLY INTEGRATE SCIENCE AND MANAGEMENT

An organized, science-based management program is needed to provide the framework for FISH Plan and RCMP implementation. Such a program would describe what we are doing, why, the likelihood of success, how we will know if the actions are successful, how we will learn from our efforts, and how lessons learned will be linked to management decision-making processes. It should be based on both ecosystem and project-specific monitoring. It should take data and translate it into “information,” making it available to decision-makers. In response to this challenge, the following two efforts are underway:

- Development of monitoring and adaptive management programs for the FISH Plan; and
- Development of a proposed, RCMP-level “Science-Based Management Program.”

8.1.2 NEED TO EFFECTIVELY FIELD QUESTIONS ABOUT FISH PLAN RECOMMENDATIONS

Interested parties who did not participate directly in negotiations may have questions or initial concerns about FISH Plan and RCMP recommendations. To ensure the recommendations are implemented, Task Force and working group members need to be able to respond effectively to such questions or concerns. There are three strategies for doing this, as follows:

- At the RCMP level, the RCMP Roll-out Committee is organizing briefings for elected officials and other interested parties, and a workshop for the public;

- As the Lower American River Science-Based Management Program is developed, opportunities are likely to emerge for those with stakes in RCMP implementation to participate directly in that program; and
- RCMP and FISH Plan implementation is expected to involve many teams with different leaders, but overlapping membership; this approach is expected to help develop broad ownership in the RCMP.

8.1.3 NEED TO OBTAIN IMPLEMENTATION FUNDS

A number of FISH Plan recommendations have some funding, or would build on and leverage past investments. However, substantial funding is needed to fully implement FISH Plan recommendations. Anticipated strategies for obtaining needed funds include:

- Cooperative agreements between participating agencies;
- Obtaining fundraising assistance from the grantwriter whose services have been retained by SAFCA, the Water Forum, County Parks, and City Parks to develop a fundraising strategy that encompasses the lower American River as well as half a dozen other riparian corridors in the Sacramento region.

8.1.4 NEED FOR SYSTEMATIC APPROACH TO IMPLEMENTATION

In FISH Plan implementation, a balance needs to be found between taking advantage of time-sensitive project implementation opportunities and a more systematic and measured approach (e.g., such as that used to develop the FISH Plan). While there are action-oriented opportunities that should not be missed, there is also a real need to undertake selected studies to ensure that we chart a wise course in lower American River management. Strategies to assist in achieving this balance include:

- Ongoing dialogue within the LAR Task Force, FWG and TSC regarding how to implement the RCMP and FISH Plan;
- Formulation of clear descriptions of specific expectations associated with each recommendation;
- Development of shared protocols where appropriate; and
- Where possible, allowing a comfortable amount of time for deliberations on implementation strategies and decisions.

8.1.5 NEED FOR MORE TIMELY PERMITTING PROCESS FOR RESTORATION PROJECTS

There is a widely-held perception that it is difficult to obtain the permits necessary to undertake projects in the lower American River, even for those specifically intended to benefit lower American River fish and aquatic habitat. This is believed to be due to staffing shortages within the Endangered Species offices of USFWS and NMFS. Strategies proposed to address this challenge include:

- Seeking an expedited ESA review and permitting process for actions included in the FISH Plan; and
- Developing the above-referenced Lower American River Science-Based Management Element, closely involving CalFed in that effort.

8.1.6 POSSIBLE NEED FOR MORE FORMAL RIVER CORRIDOR MANAGEMENT PLAN ADMINISTRATIVE STRUCTURES

As discussed in Section 8.6.1. above, the primary administrative structures anticipated to support FISH Plan and RCMP implementation for the duration of the RCMP's 3-year action plan remain the LAR Task Force and its working groups. It has been suggested that more formal administrative arrangements (e.g., establishment of a watershed conservancy, joint powers agency, etc.) may be needed to support the most effective possible form of integrated management for the lower American River.

This subject is expected to be fully discussed during the update of the American River Parkway Plan. Addressing it in that venue and timeframe will allow for: (a) a thorough exploration of various options for administrative structures that could be used; and (b) the participation of state and local elected officials in determining the most appropriate administrative arrangements for coordinated management of the lower American River.