FISHERIES
CHARTERS APPENDIX

FOR THE
2016 ANNUAL WORK PLAN
PUBLIC DRAFT

CENTRAL VALLEY PROJECT IMPROVEMENT ACT
TITLE XXXIV OF PUBLIC LAW 102-575

JULY 9, 2015

Contents

b2 operations

Develop operational products used to make b2 management decisions

Classification: Administration, Water Operations

Location: , Central Valley Wide

Funding Years: 2015 - 2016

Benefits Start Year: 2015

Priority: 2 - Priority 1 (admin) and priority 2(operations) are intertwined.

Partners: No Data.

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(2) Dedicated Yield	100.0%	

Metrics

Name	Value	Units	Comment
CVP yield	800000	acre-feet	
Salmonid doubling	-9999	number of fish	AFRP stream dependent

Deliverables

Date	Title
Sep. 2016	Annual Accomplishment Report
Sep. 2016	Annual Narrative Summary
Sep. 2016	Annual Operations and Accounting Presentation

Narrative

This charter is the operational funding for implementation of the (b)(2) program. It includes both FWS and USBR staff

time for interagency coordination and collaboration, technical workgroup participation, operational forecast development, hydrologic modeling support, and daily accounting procedures.

Data Management

The (b)(2) Program generates both monthly and annual data products. On a monthly basis, Reclamation produces 12-month

operational forecasts that include estimates of water year (b)(2) fishery actions and daily accounting of both (b)(2) and non-(b)(2)

fishery actions. At the end of each water year, the Program also produces summary documents that include (b)(2) daily accounting, a

narrative summary, and annual accounting summary tables. All of these data products are posted on the Reclamation Central Valley

Office (CVO) website at the appropriate time of year:

http://www.usbr.gov/mp/cvo/

Risks

No Data.

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$320,213	$97,244	$222,970
2017	CVPRF	$320,213	$97,244	$222,970
2018	CVPRF	$320,213	$97,244	$222,970

Total Cost: $960,640

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation - Forecast/Accounting/Modeling				
Labor	$11,376	FWS	CVPRF	Hydrologic computer model simulations will be conducted on a monthly basis (CVP forecast model) to assess various (b)(2) implementation scenarios, and CALSIM II and ECOSYM modeling will be done on an as needed basis
Labor	$97,244	BOR	CVPRF	Develop CVP monthly forecasts, daily accounting
Labor	$56,880	FWS	CVPRF	Develop CVP monthly forecasts, daily accounting
Planning and Analysis - Interagency Collaboration				
Labor	$154,714	FWS	CVPRF	b2 Interagency Team meetings. Confer with project operators and biologists to determine when and where b2 water should be used.
2017				
Implementation - Forecast/Accounting/Modeling				
Labor	$11,376	FWS	CVPRF	Hydrologic computer model

Type	Total	Agency	Fund	Description
				simulations will be conducted on a monthly basis (CVP forecast model) to assess various (b)(2) implementation scenarios, and CALSIM II and ECOSYM modeling will be done on an as needed basis.
Labor	$97,244	BOR	CVPRF	Develop CVP monthly forecasts, daily accounting
Labor	$56,880	FWS	CVPRF	Develop CVP monthly forecasts, daily accounting
Planning and Analysis - Interagency Collaboration				
Labor	$154,714	FWS	CVPRF	b2 Interagency Team meetings. Confer with project operators and biologists to determine when and where b2 water should be used.
2018				
Implementation - Forecast/Accounting/Modeling				
Labor	$97,244	BOR	CVPRF	Develop CVP monthly forecasts, daily accounting
Labor	$11,376	FWS	CVPRF	Hydrologic computer model simulations will be conducted

Type	**Total**	**Agency**	**Fund**	**Description**
				on a monthly basis (CVP forecast model) to assess various (b)(2) implementation scenarios, and CALSIM II and ECOSYM modeling will be done on an as needed basis.
Labor	$56,880	FWS	CVPRF	Develop CVP monthly forecasts, daily accounting
Planning and Analysis - Interagency Collaboration				
Labor	$154,714	FWS	CVPRF	b2 Interagency Team meetings. Confer with project operators and biologists to determine when and where b2 water should be used.

AFSP Base Projects

AFSP Fish Screen Projects

Classification:	Improvement, Diversion Screening
Location:	, Central Valley Wide
Funding Years:	2015 - 2016
Benefits Start Year:	2016
Priority:	1 - Base funding for one or more small screens.
Partners:	CDFW, NMFS
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(21) AFSP	100.0%	

Metrics

No Data.

Deliverables

No Data.

Narrative

This action consists of providing cost share funding for construction of fish screen projects in Central Valley streams. In Fiscal Year 2015, the AFSP funded activities to assess fish projects in priority watersheds in the Central Valley, and the AFSP is currently coordinating with CDFW, NMFS and USFWS (AFRP) to assess additional fish projects to be funded in Fiscal Year 2016. Project selection will be based on project cost and benefits, and project readiness. Priority will be given to projects that have matching non-federal cost share funding (at least 50% cost share match).

Data Management

Information resulting from activities funded by this charter, including all program reports, will be permanently housed at BOR's Mid-Pacific Regional Office in Sacramento, and FWS's Pacific Southwest Regional Office in Sacramento.

Risks

Risk	Likelihood	Impact
Screen projects require cost share match	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$760,676	$0	$760,676

Total Cost: $760,676

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Construction - This action provides cost share funding by the AFSP towards Central Valley fish screen projects.				
Equipment or Materials	$760,676	FWS	CVPRF	Cost share funding to design and construct fish screen projects.

AFSP Additional Projects

AFSP Fish Screen Projects

Classification:	Improvement, Diversion Screening
Location:	, Central Valley Wide
Funding Years:	2015 - 2016
Benefits Start Year:	2016
Priority:	2 - Additional funding for small screens for consideration under competitive project funding.
Partners:	CDFW, NMFS
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(21) AFSP	100.0%	

Metrics

No Data.

Deliverables

No Data.

Narrative

This action consists of providing cost share funding for construction of fish screen projects in Central Valley streams. In Fiscal Year 2015, the AFSP funded activities to assess fish projects in priority watersheds in the Central Valley, and the AFSP is currently coordinating with CDFW, NMFS and USFWS (AFRP) to assess additional fish projects to be funded in Fiscal Year 2016. Project selection will be based on project cost and benefits, and project readiness. Priority will be given to projects that have matching non-federal cost share funding (at least 50% cost share match).

Data Management

Information resulting from activities funded by this charter, including all program reports, will be permanently housed at BOR's Mid-Pacific Regional Office in Sacramento, and FWS's Pacific Southwest Regional Office in Sacramento.

Risks

Risk	Likelihood	Impact
Fish screen projects require a cost share match.	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$200,000	$0	$200,000

Total Cost: $200,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Construction - This action provides cost share funding by the AFSP towards Central Valley fish screen projects.				
Agreement	$200,000	FWS	CVPRF	Cost share funding to design and construct fish screen projects.

CAMP rotary screw trap Platform enhancements

Document, maintain, and enhance a complex computer application that stores and analyzes rotary screw trap data at several locations across the Central Valley

Classification: Performance Monitoring, Performance Monitoring

Location: , Central Valley Wide

Funding Years: 2015 - 2016

Benefits Start Year: 2015

Priority: 1 - Funding is required to bring the CAMP RST Platform to a complete level of capability and funds are needed to develop the metadata/documentation that Platform user's require to understand how different data analyses are conducted. Charter is to be funded using the FY 2016 CAMP President's budget allocation.

Partners: Pacific States Marine Fisheries Commission

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Comprehensive Assessment and Monitoring Program

Metrics

Name	Value	Units	Comment
data management	0	number of fish	The outputs from the CAMP rotary screw trap Platform have the unique advantage over other data storage systems in that the CAMP Platform standardizes a variety of juvenile Chinook salmon data, e.g., the calculation of juvenile salmon production estimates. That advantage facilitates the ability to compare and combine juvenile salmon data from different watersheds, and allows them to be combined in a synergistic fashion to answer questions that are pertinent at a Central Valley-wide scale.

Deliverables

Date	Title
Sep. 2016	Enhance various analysis and reporting capabilities involving the CAMP RST Platform in 2016

Narrative

Document, maintain, and enhance the programming code the conducts sophisticated analyses by the CAMP Rotary Screw Trap Platform. The Platform produces juvenile Chinook salmon production estimates and a diverse array of data summaries. Juvenile salmon production estimates for the following watersheds are expected to be available in FY 2016: American River, Battle Creek, Clear Creek, Feather River, Mokelumne River, Red Bluff Diversion Dam at the Sacramento River, and Stanislaus River.

Data Management

The CAMP Rotary Screw Trap Platform consists of three components. These are: (1) programming code that provides a user interface that allows raw data to be entered in the Platform, (2) a Microsoft Access database used to store raw data, and (3) Program R programming code that analyzes and summarizes data. This charter provides funding to enhance the analytical capabilities of the existing R programming code.

Risks

Risk	Likelihood	Impact
low, unless funding distribution is delayed	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$100,000	$0	$100,000
2017	CVPRF	$60,000	$0	$60,000

Total Cost: $160,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Agreement	$100,000	FWS	CVPRF	Cost includes a 6% contract overhead cost.
2017				
Monitoring -				
Agreement	$60,000	FWS	CVPRF	Cost includes a 6% contract overhead charge.

Pacific States Marine Fisheries Commission database support

Provide database support to the CAMP program manager

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Central Valley Wide
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	1 - The database support allows the CAMP to function in a productive and effective manner. Charter is to be funded using the FY 2016 CAMP President's budget allocation.
Partners:	Pacific States Marine Fisheries Commission
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Comprehensive Assessment and Monitoring Program

Metrics

Name	Value	Units	Comment
support to CAMP Program Manager	1	number of fish	The database specialist provides continuous support to the CAMP Program Manager, thereby facilitating the acquisition and provision of high quality data sets in a timely fashion. For example, some data sets have already been provided for use in the CVPIA 'Big Data' project, and other data will be used in the context of the decision support models associated with the new proposed CVPIA Implementation Plan.

Deliverables

Date	Title
Oct. 2015	various databases

Narrative

The CAMP program manager requires staff assistance to collect and check the quality of new rotary screw trap data collected by various partners. A database specialist that works for the Pacific States Marine Fisheries Commission will provide that assistance. The person will also help to resolve outstanding data issues in historical rotary screw trap data. The database specialist provides support on other projects on an as needed basis, e.g., building and enhancing

a database that will be used by CVPIA managers as proposed projects are ranked according to priority and funding need.

Data Management

The database specialist stores data in a variety of databases, e.g., the backend database in the CAMP rotary screw trap platform.

Risks

Risk	Likelihood	Impact
low, unless funding distribution is delayed	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$116,000	$0	$116,000
2017	CVPRF	$119,480	$0	$119,480

Total Cost: $235,480

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Agreement	$116,000	FWS	CVPRF	cost includes 6% contract overhead cost
2017				
Monitoring -				
Agreement	$119,480	FWS	CVPRF	2017 cost includes 6% contract overhead cost and a 3% inflation cost over and above the 2016 cost

b1 Bay-Delta Sturgeon Age, Growth, and Microchemistry

Study and analysis of Age, Growth and Fin Ray Microchemistry of Sturgeon in the Sacramento and San Joaquin River Delta

Classification:	Reconnaissance, Reconnaissance
Location:	, Central Valley Wide
Funding Years:	2015 - 2017
Benefits Start Year:	2015
Priority:	11 - Final portions of a five year evaluation of the effects of contaminants on sturgeon (Central Valley-Wide Evaluations 6 & 8). No funding request beyond FY16.
Partners:	CDFW, Cramer Fish Sciences, Foundation Sportsman's Club, UC-Davis
Related Programs:	Interagency Ecological Program

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Both White and Green Sturgeons are included as anadromous species under CVPIA, with unique doubling goal targets and actions/evaluations in the Final Restoration Plan. However, limited resources have resulted in a highly limited understanding of the status of these populations and how we might recover them or manage their habitats. Beginning to understand some of the structure of these populations and how they are impacted by their current environment is needed to inform any future work that CVPIA and our partners may do with these fish.

Metrics

Name	Value	Units	Comment
Age, growth and impacts of contaminants on sturgeons report	1	number of reports	

Deliverables

Date	Title
Jul. 2016	Final Data Report and Management Recommendations

Narrative

White Sturgeon are an anadromous fish species 'identified for restoration in the CVPIA' (Final Restoration Plan 2001). Accordingly, a doubling goal has been established and the Final

Restoration Plan for the Anadromous Fish Restoration Program outlined various actions and evaluations needed to achieve doubling. Two of those, Central Valley-Wide evaluations 6 and 8, involve evaluating the effects of trace elements and other contaminants on the health and production of White and Green sturgeons.

Understanding movement patterns in White Sturgeon will provide greater resolution when evaluating contaminant loads (and biological end-points; e.g., intersex, decreased fecundity, histopathology abnormalities). Further, additional data derived from fin ray microchemistry analyses can provide useful information for future management including: determining basin of origin, identifying common juvenile rearing areas, and characterizing contemporary age at first spawning migration, spawning periodicity, and common migratory patterns. This information will be used to inform areas to focus habitat restoration actions and whether those actions should be contaminants remediation or physical construction projects or water management decisions.

Final funding is needed to complete microchemical analyses of fin rays from White Sturgeon collected during CDFW trammel netting operations and angler-harvested fish and complete final analyses (e.g., contaminants, microchemistry) and project reports.

Data Management

Data generated from this project will be stored in databases at the Lodi Fish and Wildlife Office and reports will be available on the office website.

Risks

Risk	Likelihood	Impact
Additional Data Opportunities; see 2nd paragraph of narrative; these are expected and of unknown, but positive, impact.	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$238,500	$0	$238,500

Total Cost: $238,500

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Inventory/Reconnaissance - Collect biological samples; conduct general toxicology and histopathology screening; analyze fin ray microchemistry.				
Agreement	$128,790	FWS	CVPRF	This covers tasks associated with completing the

Type	**Total**	**Agency**	**Fund**	**Description**
				collection and processing of biological tissue samples.
Reporting - Perform statistical analyses on results of biological tissue sampling tasks and begin development of comprehensive project report.				
Agreement	$109,710	FWS	CVPRF	This covers tasks associated with completing statistical analyses, modeling, and the comprehensive report.

b1 Sturgeon Population Dynamics and Demographics Evaluation

The purpose of the proposed research is to evaluate the population demographics and dynamics of White Sturgeon, develop an age-structured population model, evaluate different management and habitat restoration alternatives, and project a realistic timeline for achieving doubling.

Classification:	Research, Reconnaissance
Location:	, Central Valley Wide
Funding Years:	2015 - 2017
Benefits Start Year:	2016
Priority:	19 - Program Priority Comments: This has been identified as an urgent need in order to inform doubling goal progress tracking and high-priority action implementation needs for meeting the doubling goal for White Sturgeon.
Partners:	USGS, CDFW
Related Programs:	Interagency Ecological Program

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Both White and Green Sturgeons are included as anadromous species under CVPIA, with unique doubling goal targets and actions/evaluations in the Final Restoration Plan. However, limited resources have resulted in a highly limited understanding of the status of these populations and how we might recover them or manage their habitats. Beginning to understand some of the structure of these populations and how they are impacted by current management and the environment is needed to inform any future work that CVPIA and our partners may do with these fish.

Metrics

Name	Value	Units	Comment
Doubling progress evaluation	1	number of reports	

Deliverables

Date	Title
Dec. 2017	Management implications report
Dec. 2016	Management implications annual report

Narrative

White Sturgeon are an anadromous fish species 'identified for restoration in the CVPIA' (Final Restoration Plan 2001). Accordingly, a doubling goal has been established and the Final Restoration Plan for the Anadromous Fish Restoration Program includes six stated general objectives that need to be met to achieve the program goal. Two of those general objectives support the need for this project: collect fish population, health, and habitat data to facilitate evaluation of restoration actions; integrate habitat restoration efforts with harvest and hatchery management.

The purpose of the proposed research is to evaluate the population demographics and dynamics of White Sturgeon, and provide managers with current, system-specific data on White Sturgeon in the Central Valley of California. Specifically, we will use data on the population demographics (e.g., age at maturity, sex ratio, spawning frequency) and dynamics (e.g., growth, mortality) to develop an age-structured population model. Research leading to an understanding of the complexities of White Sturgeon ecology is essential to achieve the doubling goal. The model will identify critical periods in the life history of White Sturgeon in the system and serve as a platform to evaluate different management and habitat restoration alternatives that should lead to achieving the doubling goal, as well as projecting a realistic timeline.

Data Management

Data and resulting reports will be archived at the Lodi FWO.

Risks

Risk	Likelihood	Impact
Permitting needed to conduct new research, if needed. Existing data is likely sufficient, so this is low risk, low impact.	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$121,900	$0	$121,900
2017	CVPRF	$121,900	$0	$121,900

Total Cost: $243,800

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Research - Age-structured population model				
Agreement	$121,900	FWS	CVPRF	Funding graduate student project; year 1 of 2.

Type	Total	Agency	Fund	Description
2017				
Research - Age-structured population model				
Agreement	$121,900	FWS	CVPRF	Funding graduate student project; year 2 of 2.

SDM Phase 2

Structured Decision Making Phase 2 Public Process

Classification:	Administration, Administration
Location:	, Central Valley Wide
Funding Years:	2015 - 2018
Benefits Start Year:	2016
Priority:	1 - This is a CVPIA programmatic priority necessary for funding other fisheries activities.
Partners:	CDWR, NMFS, CDFW
Related Programs:	CALFED, BDCP, NMFS-RP, EWP

Authority

Provision	Percentage	Comment
Administration	100.0%	Necessary for alignment of the Restoration Fund and other resources on fisheries actions.

Metrics

Name	Value	Units	Comment
b1: Contribute towards Priority Actions	0	N/A	results will help prioritize actions

Deliverables

Date	Title
Apr. 2014	Report: SDM Public Process Outcomes

Narrative

This Charter provides support for development of the Adaptive Resource Management Decision Support Models.

Data Management

Information developed by this Charter will ultimately be housed on our CVPIA website (in development), and will be accessible to other agencies, stakeholders and the Public. The model and all of its accompanying data would be accessible to individuals or entities interested in refining the model, or using the model test against other like models.

Risks

No Data.

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$201,250	$0	$201,250
2017	CVPRF	$300,000	$0	$300,000
2018	CVPRF	$300,000	$0	$300,000

Total Cost: $801,250

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Inventory/Reconnaissance - Task will be for our SDM expert to work with CVPIA staff, CORE team members and the public on refinining our decision model and sub-models				
Agreement	$100,000	FWS	CVPRF	Contractor will update and refine the SDM decision model and submodels based on input we receive from stakeholders and the public
Planning and Analysis - FWS will work with the data obtained from the SDM modeling process. Goal of this task will be to build internal capacity for the care and feeding of future updates, revisons and analyses to the SDM modeling process.				
Agreement	$33,750	FWS	CVPRF	Staff time for FWS staff member to work with the data obtained from the SDM modeling process. Resource type to be determined.
Reporting - Funds will be used to report out on the progress of the SDM to other agencies, stakeholders and the public				
Agreement	$67,500	FWS	CVPRF	Funds will be used to report out on the progress of the SDM to other agencies, stakeholders and the public. Resource type to be determined.
2017				
Planning and Analysis - Out-year SDM Support				
Agreement	$300,000	FWS	CVPRF	Additional agreements and labor to be determined for continuing the SDM effort.
2018				
Planning and Analysis - Out-year SDM Support				
Agreement	$300,000	FWS	CVPRF	Additional agreements and labor to be determined for continuing the SDM effort.

American River rotary screw trap monitoring

Quantify production of juvenile Chinook salmon and the abundance of juvenile steelhead in the American River using rotary screw traps.

Classification:	Performance Monitoring, Performance Monitoring
Location:	Watershed, American River
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	1 - Monitoring of juvenile salmon production on the American River provides fundamental data that are necessary to assess the biological response to habitat restoration activities in a CVP watershed. The project is also a CAMP-recommended monitoring activity in the CAMP Implementation Plan (element #76), and it is a required element in the OCAP biological opinion. Charter is to be funded using the FY 2016 CAMP President's budget allocation.
Partners:	CDFW, Pacific States Marine Fisheries Commission
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Comprehensive Assessment and Monitoring Program

Metrics

Name	Value	Units	Comment
count of fish produced	0	number of fish	The production or abundance of different life stages of juvenile salmon and steelhead are calculated on an annual basis based on monitoring data that are collected with rotary screw traps.

Deliverables

Date	Title
Dec. 2016	annual American River rotary screw trap report

Narrative

The rotary screw trap monitoring activities in the American River provide data that can be used to assess the biological response to habitat management activities in that watershed. As such, they can be used to infer, at a watershed-level scale, how habitat restoration activities are affecting the number of juvenile Chinook salmon and steelhead in that river. The CAMP and its partner entities (California Department of Fish and Wildlife and Pacific States Marine Fisheries

Commission) have had an excellent record collecting high quality data and producing deliverables on a timely basis in 2013, 2014, and 2015. The 2013 and 2014 reports are currently available on the CAMP website at: http://www.fws.gov/sacramento/Fisheries/CAMP-Program/Documents-Reports/fisheries_camp-program_documents-reports.htm

Data Management

The American River rotary screw trap data will be stored in a digital database maintained by the CAMP. Data summaries from that database can be provided to CVPIA managers, stakeholders and the public on an as needed basis.

Risks

Risk	Likelihood	Impact
low, unless funding distribution is delayed	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$190,800	$0	$190,800
2017	CVPRF	$196,524	$0	$196,524

Total Cost: $387,324

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Agreement	$190,800	FWS	CVPRF	Project cost includes the 6% contract overhead cost.
2017				
Monitoring -				
Agreement	$196,524	FWS	CVPRF	The 2017 project cost uses the 2016 cost estimate (and therefore includes the 6% contract overhead cost), and includes a 3% inflation cost.

American River SDM model development and monitoring

Refine the SDM model for the American River and expand it to include all management decisions, rather than just spawning and rearing habitat restoration

Classification:	Performance Monitoring, Performance Monitoring
Location:	Watershed, American River
Funding Years:	2015 - 2018
Benefits Start Year:	2016
Priority:	- This is an ongoing action for the American River and a high priority (listed as AFRP - American River Structured Decision Making (SDM) Monitoring Studies)
Partners:	No Data.
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(13) Gravel	33.0%	SDM model would support b13 decisions
(b)(2) Dedicated Yield	33.0%	SDM model would support b2 decisions
(b)(3) Instream Flows	34.0%	SDM model would support b3 decisions

Metrics

No Data.

Deliverables

No Data.

Narrative

Managers and scientists on the American River spawning and rearing habitat restoration team (including multiple agency partners and stakeholders) participated in a structured decision making (SDM) workshop in October 2012. During the rapid prototyping workshop, team members identified and structured management objectives and developed a draft prototype model for evaluating the effectiveness of alternative management actions in the face of uncertainty. The draft prototype model was parameterized using the expert judgment of the participants and was considered a good first approximation that required further modification to be useful for management decision making. The model allows for the integration of monitoring data so that reliable information on the factors affecting salmonids and their habitats is updated as data are collected.

Workshop participants and other partners (including the Water Forum and agency partners) have identified the need to expand the model to support other decisions made to manage the American

River, including spawning and rearing habitat restoration, temperature management, and flow management. In 2014 and 2015 managers have implemented emergency drought monitoring to help inform real-time operations for temperature and flow management. To best learn from these monitoring efforts, these data should be incorporated into the SDM model and the model should be expanded to support decisions made to support real-time operations. In addition to benefits for managing salmon and steelhead, the Water Forum stakeholders and individual water and power purveyors in the American River basin are all affected by real-time operations decisions for the American River and would all benefit from a tool that can show predicted trade-offs of alternative management actions. In addition, it is expected that this model will inform all watershed-scale monitoring for the American River (i.e., all monitoring that is not considered implementation monitoring of specific projects) and will also be available to the CVPIA DSMs.

Deliverables:

(1)A decision support tool to evaluate trade-offs of alternative management actions related to water operations, temperature management, and habitat restoration and support discussions and recommendations about real-time operations.

(2)All related data sets and reports

Objectives:

(1)Refine the existing prototype model in cooperation with gravel team members and an expanded group of scientists and stakeholders to include water operations and temperature;

(2)Identify and compile existing data and information for parameterizing the refined model;

(3)Parameterize the prototype model relating candidate management actions and uncontrolled drivers to the predicted responses of anadromous salmonid populations under alternative hypotheses;

(4)Perform sensitivity analyses to identify key uncertainties and prioritize future monitoring efforts; and

(5)Develop a means to integrate new and existing monitoring data to reduce key uncertainties and improve future decision-making.

(6) Collect additional early life stage monitoring data as needed to refine specific model parameters (e.g., egg, larvae, and juvenile growth and survival data using rotary screw traps, egg tubes, acoustic tagging, etc.).

Data Management

Data management is a key consideration under the Structured Decision Making approach and the model is meant to be a tool that can synthesize all existing data collected for the American River. Initially, all data will be housed by FWS and BOR (implementing agencies) with Julie

Zimmerman and John Hannon as contacts. Eventually, data management will be coordinated with the CVPIA Center for Data Management.

Risks

Risk	Likelihood	Impact
No funding so it doesn't occur.	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$975,000	$0	$975,000
2017	CVPRF	$750,000	$0	$750,000
2018	CVPRF	$750,000	$0	$750,000

Total Cost: $2,475,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - Monitoring to support biological response to real-time water operations, including flow pulses and temperature, particularly in response to drought. This monitoring began in FY14, continued in FY15, and has been jointly funded by the Water Forum ; Cramer Fish Sciences - $100,000				
Agreement	$100,000	FWS	CVPRF	
Monitoring - Early life stage Chinook salmon growth and survival in the LAR will be assessed with the intent of refining SDM model parameters - $450,000				
Agreement	$300,000	FWS	CVPRF	
Equipment or Materials	$150,000	FWS	CVPRF	
Planning and Analysis - Hydraulic modeling updates, redd dewatering analyses, modeling to support prioritization of habitat restoration projects; CBEC - $50,000				
Agreement	$50,000	FWS	CVPRF	
Planning and Analysis - SDM model refinement; inter-agency agreement with Jim Peterson, USGS - $75,000				
Agreement	$75,000	FWS	CVPRF	

Type	Total	Agency	Fund	Description
Research - Continue studies to inform the SDM model (began in FY15) collectively titled "Quantifying the benefits of restoration actions and flow management to juvenile Chinook salmon production and survival to adulthood". Objectives of the studies include (1) the extent to which restored spawning sites produce a greater number of juveniles to the CVPIA-funded rotary screw traps than non-enhanced sites and (2) how water operations influence the expression and survival of different outmigration strategies (fry, parr, smolts) to adulthood; Cramer Fish Sciences - $300,000				
Agreement	$300,000	FWS	CVPRF	
2017				
Monitoring - Early life stage Chinook salmon growth and survival in the LAR will be assessed with the intent of refining SDM model parameters - $450,000				
Equipment or Materials	$150,000	FWS	CVPRF	
Agreement	$300,000	FWS	CVPRF	
Research - Continue studies to inform the SDM model (began in FY15) collectively titled "Quantifying the benefits of restoration actions and flow management to juvenile Chinook salmon production and survival to adulthood". Objectives of the studies include (1) the extent to which restored spawning sites produce a greater number of juveniles to the CVPIA-funded rotary screw traps than non-enhanced sites and (2) how water operations influence the expression and survival of different outmigration strategies (fry, parr, smolts) to adulthood; Cramer Fish Sciences - $300,000				
Agreement	$300,000	FWS	CVPRF	
2018				
Monitoring - Early life stage Chinook salmon growth and survival in the LAR will be assessed with the intent of refining SDM model parameters - $450,000				
Equipment or Materials	$150,000	FWS	CVPRF	
Agreement	$300,000	FWS	CVPRF	
Research - Continue studies to inform the SDM model (began in FY15) collectively titled "Quantifying the benefits of restoration actions and flow management to juvenile Chinook salmon production and survival to adulthood". Objectives of the studies include (1) the extent to which restored spawning sites produce a greater number of juveniles to the CVPIA-funded rotary screw traps than non-enhanced sites and (2) how water operations influence the expression and survival of different outmigration strategies (fry, parr, smolts) to adulthood; Cramer Fish Sciences - $300,000				
Agreement	$300,000	FWS	CVPRF	

American River Spawning and Rearing Habitat FY16

Restoration and enhancement of spawning and rearing habitat for anadromous fish in the Lower American River at Sacramento Bar, primarily through gravel addition and/or floodplain or side channel excavation.

Classification: Improvement, Habitat Restoration

Location: , American River

Funding Years: 2015 - 2018

Benefits Start Year: 2016

Priority: -

Partners: CDFW, NMFS, CSUS, Sacramento County, Cramer Fish Sciences, Sacramento Water Forum, cbec, inc.

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(13) Gravel	100.0%	

Metrics

Name	Value	Units	Comment
b13: American R: percentage of spawning CHINOOK using placed gravel	25	percentage of fish	
b13: American R; Spawning gravel placed annually(tons)	7000	tons	
b13: American R: percentage of egg retention in females	0	percentage of fish	
b13: American R: percentage of spawning STEELHEAD using placed gravel	25	percentage of fish	

Deliverables

Date	Title
Sep. 2016	2016 Biological monitoring results
Sep. 2016	2016 Physical monitoring results
Sep. 2016	2016 Engineering design and as-built data and report
Sep. 2017	2017 Site design, monitoring and as-builts

Narrative

In a free flowing river rocks, gravel, dirt, and other materials are continually moving downstream providing diverse habitats for successful salmonid spawning and juvenile rearing. The

construction of dams has had a dramatic effect on streams by impeding this process. Below the dams coursecoarse sediment continues to be transported downstream by the flowing water without it being replaced by upstream sources. Section 3406(b)(13) was included in the CVPIA to provide for a continuing program for replacing, as needed, this material blocked by the dams along with the associated habitat values. Sediment deficits have been estimated for the project rivers. This program seeks to replace a portion of the gravel deficits with a focus on sites where the greatest habitat values can be achieved. Spawning gravel is most limited and adult fish are usually most abundant in upstream reaches below the dams so the program has focused on those areas first. The program is now implementing projects that incorporate both spawning and rearing habitat features to address the freshwater lifestages of salmonids. The major program performance goals as stated in CPAR and other documents are to (1) increase the availability of spawning and rearing habitat for American River Basin Chinook salmon and steelhead trout by placing 7,000 tons of gravel; (2) Support at least 25% of riverwide spawning salmonids on gravel placement projects; (3) Less than 10% egg retention in Chinook salmon.

Gravel in the American River has been placed to create habitat features anticipated to be immediately usable by salmonids. Gravel has been placed at nine sites in the American River in 1999 and 2008 - 2014: three locations at Sailor Bar, two locations at upper Sunrise, downstream of Lower Sunrise Bridge, at Sacramento Bar, at Riverbend Park/William Pond Park, and in the Nimbus Basin. The substrate at the sites was manipulated prior to gravel placement in order to improve water quality conditions within the gravel (the area where eggs develop) after the gravel was in place. The conditions in the regions where gravel was placed has been monitored and compared with pre-project conditions and to conditions in adjacent areas. A five year series of projects began implementation in 2008 and a series of five new sites (projects) will be selected using a Structured Decision Making process and permitted in FY16. Reclamation contracted with the Water Forum (City of Sacramento) for assistance in the permitting, placement, and monitoring of projects. Placements through 2013 totaled 91,880 tons. Work has occurred at all of the sites (seven main channel and three side channel sites) identified in the initial planning document. The program is continuing work on a planning framework using a Structured Decision Making process to help guide American River project selection, design, and monitoring (see associated charter). A data repository is being developed to house documents and data relevant to the projects.

Data Management

A data repository is being developed to house documents and data relevant to the projects. In addition, monitoring data will be incorporated into the Lower American River SDM (Structured Decision Making) model as it becomes available, so that knowledge gained through implementation and monitoring is accessible and used to influence future decisions in an adaptive management framework.

Risks

Risk	Likelihood	Impact
permitting not completed	2	2
landowner agreements	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$600,000	$600,000	$0
2017	CVPRF	$600,000	$600,000	$0
2018	CVPRF	$600,000	$600,000	$0

Total Cost: $1,800,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Design - Design spawning and/or rearing habitat restoration projects, including hydraulic modeling, predictions of habitat suitability, construction plans, surveying, and as-built analysis.				
Agreement	$100,000	BOR	CVPRF	
Implementation - Permit, design, and implement the project.				
Agreement	$350,000	BOR	CVPRF	$350,000 for FY16 for implementation. FY16 project is located at Sacrament Bar and includes spawning gravel restoration, floodplain restoration, and creation of a side channel for spawning and rearing habitat. This is a large site that may be restored over multiple years.
Monitoring - Effectiveness monitoring				
Agreement	$150,000	BOR	CVPRF	Effectiveness monitoring
2017				
Design - Design spawning and/or rearing habitat restoration projects, including hydraulic modeling, predictions of habitat suitability, construction plans, surveying, and as-built analysis.				
Agreement	$100,000	BOR	CVPRF	
Implementation - Permit, design, and implement the project.				
Agreement	$350,000	BOR	CVPRF	Implementation and construction
Monitoring - Effectiveness monitoring				
Agreement	$150,000	BOR	CVPRF	Effectiveness monitoring

Type	Total	Agency	Fund	Description
2018				
Design - Design spawning and/or rearing habitat restoration projects, including hydraulic modeling, predictions of habitat suitability, construction plans, surveying, and as-built analysis.				
Agreement	$100,000	BOR	CVPRF	
Implementation - Permit, design, and implement the project.				
Agreement	$350,000	BOR	CVPRF	Implementation and construction
Monitoring - Effectiveness monitoring				
Agreement	$150,000	BOR	CVPRF	Effectiveness monitoring

b1 North Fork Battle Creek Natural Barrier Removal

North Fork Battle Creek Natural Barrier Removal

Classification: Improvement, Fish Passage

Location: , Battle Creek

Funding Years: 2015 - 2019

Benefits Start Year: 2017

Priority: 17 - Identified as a priority in the 2016 Interim Priorities process, Final Restoration Plan, NMFS Recovery Plan, part of RPA action I.2.6, highest priority for Battle Ck Working Group and received 2014 Emergency Drought Funding from State

Partners: Battle Creek Working Group

Related Programs: California Drought Response

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Fish Passage	2	number of improvements	Improvement of passage at the two barriers would greatly contribute to the restoration and recovery of listed salmonids
Fish Passage	100	percentage of fish	Improvement of passage at the two barriers would greatly contribute to the restoration and recovery of listed salmonids
b1 actions	1	number of actions	High Priority Action identified in Final Restoration Plan

Deliverables

Date	Title
Dec. 2016	Fish passage evaluation report
Dec. 2017	Permits acquired
Dec. 2019	Barriers Removed

Narrative

Large boulders in North Fork Battle Creek form natural barriers that impede upstream passage of salmon and steelhead. Although

much effort has gone into improving fish passage in Battle Creek at several hydropower diversion dams (i.e. Wildcat Dam has been

removed and Eagle Canyon dam and North Battle Creek Feeder Dam have new fish ladders & screens) fish are unable to migrate

upstream as envisioned for the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project). The Adaptive

Management Plan for the Restoration Project (RPA Action I.2.6) calls for the Resource Agencies to provide funding to physically

modify natural barriers. Of particular concern are the barriers on the North Fork of Battle Creek downstream of Eagle Canyon Dam (at

River Mile 4.46 and RM 5.06), and a new barrier just upstream of Eagle Canyon Dam (at RM 5.41). These barriers prevent the access

to the two new fish ladders. This action is particularly important during the drought which is resulting in high mortality of winter

Chinook in the Sacramento River. The action would allow winter Chinook to access habitat required for re-introduction and eventually

recovery. Improving passage at natural barriers in Battle Creek is a priority action in the current SDM model.

Drought relief funding received by the Department of Fish and Wildlife in 2015 will fund studies and designs to improve fish passage.

This request for funding is for permitting and implementation of barrier modifications. .

Data Management

Completed annual reports will be stored at : http://www.fws.gov/redbluff/

Risks

Risk	Likelihood	Impact
Geologic uncertainties	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS	DFW
2016		$900,000	$0	$0	$900,000
2017	CVPRF	$106,000	$0	$106,000	$0
2018	CVPRF	$530,000	$0	$530,000	$0
2016	CVPRF	$123,471	$0	$123,471	$0

Total Cost: $1,659,471

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Environmental Compliance and Permitting - After the project description is developed, the various environmental compliance and permitting documents will need to be pursued. For example NEPA/CEQA, ESA/CESA, Section 106 (cultural resources), Clean Water Act Section 401 and 404, and Flood Protection Board.				
Agreement	$900,000	DFW		Up to 900,000.00 of CDFW drought funding provided for Battle Creek may be used on this project to assess the existing situation and design restoration.
Inventory/Reconnaissance - Geologic, hydraulic and radiotelemetry evaluations of fish passage at various flows will need to occur as part of the design.				
Labor	$123,471	FWS	CVPRF	This includes multiple staff from the Red Bluff Fish and Wildlife Office. Staff will implement a radiotelemerty study to evaluate fish passage alternatives at natural barriers in North Fork Battle Creek. Requires additional labor beyond what is currently funded via CVPIA admin for RBFWO staff.
2017				
Environmental Compliance and Permitting - After the project description is developed, the various environmental compliance and permitting documents will need to be pursued. For example NEPA/CEQA, ESA/CESA, Section 106 (cultural resources), Clean Water Act Section 401 and 404, and Flood Protection Board.				
Agreement	$106,000	FWS	CVPRF	Contract for environmental compliance and permitting
2018				
Implementation - Following receiving all of the necessary permits, the project will be implemented to allow upstream passage of adults and downstream passage of juvenile salmonids.				
Agreement	$530,000	FWS	CVPRF	Contract will implement fish passage improvements identified in 2015 CDFW contract for studies and designs.

b12 Clear Cr Spawning Gravel Injection

Augment spawning gravel into Clear Creek to provide spawning habitat for anadromous salmonids and to promote geomorphic processes.

Classification:	Improvement, Spawning Gravel
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - 2016 priority document Table 5. Record ID 1275. NMFS Recovery Plan action. Implement a long-term gravel program in Clear Creek per RPA action I.1.3.
Partners:	CDWR, BLM, NPS, CDFW
Related Programs:	NMFS-RP, NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	The addition of gravel is part of the program of flows.

Metrics

Name	Value	Units	Comment
b12: Spawning gravel placed annually (tons)	25000	tons	
b12: Area of spawning hab created annually	0	square feet	

Deliverables

Date	Title
Dec. 2016	Project Completion Report

Narrative

The CVPIA (b)(12) program augments gravel in Clear Creek to meet requirements of the Central Valley Project Improvement Act (CVPIA), Section 3406 (b)(12) and the CALFED Bay-Delta Ecosystem Restoration Program, both of which have identified the lack of instream spawning gravel as a significant factor limiting anadromous fish production in Clear Creek. Since 1996, 57 gravel injection projects have added approximately 172,335 tons of spawning gravel into Clear Creek.

The U.S. Fish and Wildlife Service has documented that gravel from these injections have created new spawning habitat for all runs of Chinook salmon (Oncorhynchus tshawytscha) and

steelhead (O. mykiss). In particular, monitoring has shown that gravel added to Clear Creek has created spawning habitat that is currently used by spring-run Chinook salmon, and steelhead; both are federally listed species under the Endangered Species Act.

Therefore, the purpose of the projects is to improve spawning habitat conditions for anadromous salmonid species, including the Central Valley fall-run and late fall-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead. The project will also help to restore sediment transport processes, such as coarse bedload transport continuity and sediment deposition on floodplain surfaces.

Reclamation proposes to place clean, washed gravel, approximately ¼ to 5 inches in diameter in various project sites. The sources of the gravel will be from locations outside the active stream channels, and the gravel will have a CalTrans cleanliness value of 85 or higher, and be completely free of oils or any other petroleum based materials, clay debris, and other types of organic matter. The injection sites may change annually, to meet restoration objectives.

Planning, acquisition/contracting costs, environmental compliance actions are all performed by BOR and FWS staff, and are supported under the 'Program Management' charter.

Data Management

The information developed by this Charter will be housed at Reclamations Northern California Area Office (Shasta Dam, CA) and the U.S. Fish and Wildlife Services Red Bluff Fish and Wildlife Office (Red Bluff, CA).

Risks

Risk	Likelihood	Impact
Funding reductions	1	3
Dry climatic conditions	2	2
High fuel costs	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$123,133	$123,133	$0
2016	WRR	$144,984	$144,984	$0
2017	CVPRF	$298,698	$298,698	$0
2018	CVPRF	$300,830	$300,830	$0

Total Cost: $867,645

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation - Gravel augmentation projects at multiple sites in Clear Creek				
Agreement	$123,133	BOR	CVPRF	Combined with WRR funding to total 10,312 tons at 8 sites
Agreement	$144,984	BOR	WRR	Combined with CVPRF funding to total 10,312 tons at 8 sites
2017				
Implementation - Gravel augmentation projects at multiple sites in Clear Creek				
Agreement	$298,698	BOR	CVPRF	Gravel projects towards CVPIA target of 25,000 tons per year
2018				
Implementation - Gravel augmentation projects at multiple sites in Clear Creek				
Agreement	$300,830	BOR	CVPRF	Gravel projects towards CVPIA target of 25,000 tons per year

b12 Clear Creek Adaptive Management

Use monitoring and evaluation to improve restoration actions.

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - In 2016 Priorities Document Table 4. Ongoing Actions, Record ID 1877. OCAP BO RPA action and ongoing adaptive management of the b12 program.
Partners:	CDFW, CDWR, NMFS, BLM, Western Shasta Resource Conservation District, NRCS, Point Blue Conservation Science, NPS
Related Programs:	EWP, CALFED, CVPIA b2, California Drought Response, NMFS-RP, NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	Activities provide for the release of flows.

Metrics

Name	Value	Units	Comment
b12: Spawning gravel placed annually (tons)	25000	tons	
b12: Area of spawning hab created annually	10000	square feet	This metric was originally a target of 347,288 square feet, not an annual target.
b12: Stream Channel restored (miles)	2	miles	CPAR goal was 2 miles for the entire program based on the length of the first stream channel restoration project proposal.
b12: Variable flow target	0	cfs	Variable depending on temperature control and pulse flow needs.
b12: Water Temperature Target	56	degrees	For spring Chinook spawning and incubation, 60 for holding
b1: Contribute towards Priority Actions	1	completion	

Deliverables

Date	Title
Sep. 2016	Annual summary of benthic macroinvertebrate biosampling data
Oct. 2015	Recomendations to B2 Interagency Team
Aug. 2016	Report to OCAP Science Panel
Dec. 2016	Quarterly presentations to Clear Creek Technical Team
Sep. 2016	Annual report of juvenile spring Chinook production estimates
Sep. 2016	Annual report of spawning habitat estimates for fall and spring Chinook
Sep. 2016	Annual report of geomorphic monitoring or spawning gravel evaluation
Oct. 2015	Recomendations to Sacramento River Temperature Task Group
Oct. 2015	Provide technical assistance based on monitoring for gravel and stream channel restoration projects

Narrative

Adaptive management will be used to evaluate and improve restoration actions. Monitoring activities funded through other sources will be used in addition to the following actions in 2016.

Estimates of juvenile spring Chinook production using rotary screw trapping are used to evaluate and guide flow management. CVP flow management is used to reduce summer water temperatures in Clear Creek. Warm water temperatures can lead to mortality of early life stages of Chinook, which is reflected in the juvenile production estimates. Production estimates can also reflect and guide the success of habitat restoration projects and can identify the negative impacts of fires, landslides and poor resources management. Action required by NMFS OCAP RPA page 585 items 7 and 8.

Spawning area mapping (for fall Chinook salmon) and potential spawning area mapping (for spring Chinook salmon and steelhead), are used to evaluate spawning habitat creation and maintenance. The two types of mapping are used to evaluate the effectiveness of gravel injections, stream channel restoration and flow management. These studies provide the metrics for the CVPIA PAR goal for square feet of spawning habitat restoration. Information from the mapping is used in gravel effectiveness evaluations required in the NMFS OCAP RPA section I.1.3.

Bulk sediment sampling is used to evaluate spawning gravel quality. Sediment size information can indicate if too much deleterious fine sediment is in salmon spawning area, or if the correct size gravel is being provided by gravel injections, stream channel restoration, and flow management. Excessive fine sediments can be managed through erosion control, channel maintenance flows, pulse flows, and reduction in fuels for wildfire. Gravel effectiveness evaluations are required in the NMFS OCAP RPA section I.1.3.

Data Management

Information for the charter including relevant protocols for understanding the information, will be permanently housed at Northern California Area Office of Reclamation and the Red Bluff Fish and Wildlife Office of the Service.

Risks

No Data.

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$253,509	$0	$253,509
2017	CVPRF	$244,079	$0	$244,079
2018	CVPRF	$244,079	$0	$244,079

Total Cost: $741,668

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - Salmon and steelhead monitoring				
Labor	$91,526	FWS	CVPRF	Spawning area mapping for fall Chinook salmon and potential spawning area mapping for spring Chinook salmon and steelhead. Evaluates program spawning gravel goals.
Labor	$119,497	FWS	CVPRF	Estimate juvenile spring Chinook production using rotary screw trap
Labor	$33,052	FWS	CVPRF	Bulk sediment sampling to evaluate spawning gravel quality.
Agreement	$9,434	FWS	CVPRF	Evaluate habitat restoration projects by comparing macroinvertebrate assemblages from 75 samples.
2017				
Monitoring - Salmon and steelhead monitoring				
Labor	$119,497	FWS	CVPRF	Estimate juvenile spring Chinook production using rotary screw trap
Labor	$33,052	FWS	CVPRF	Bulk sediment sampling to evaluate spawning gravel quality.
Labor	$91,530	FWS	CVPRF	Spawning area mapping for fall Chinook salmon and potential spawning area mapping for spring Chinook salmon and steelhead. Evaluates program

Type	Total	Agency	Fund	Description
				spawning gravel goals.
2018				
Monitoring - Salmon and steelhead monitoring				
Labor	$91,530	FWS	CVPRF	Spawning area mapping for fall Chinook salmon and potential spawning area mapping for spring Chinook salmon and steelhead. Evaluates program spawning gravel goals.
Labor	$119,497	FWS	CVPRF	Estimate juvenile spring Chinook production using rotary screw trap
Labor	$33,052	FWS	CVPRF	Bulk sediment sampling to evaluate spawning gravel quality.

b12 Clear Creek Channel Maintenance Flows (aka EWP)

Plan and implement channel maintenance flows to create and maintain habitat for salmon and steelhead

Classification:	Improvement, Water Operations
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - In 2016 Priority Document Table 5. Record ID 1942. OCAP BO RPA action. High priority action in NMFS Recovery Plan. Ongoing CVPIA action.
Partners:	ESA, CDFW, CDWR, NMFS, BLM, Western Shasta Resource Conservation District, NRCS, Point Blue Conservation Science, NPS
Related Programs:	EWP, CALFED, NMFS-RP, NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	

Metrics

Name	Value	Units	Comment
3,250 cfs mean daily flow for one day	1	number of actions	CVPIA goal for channel maintenance flows: 4 successful re-operations within 10 years, with a minimum target of 3,250 cfs mean daily flow for one day, and an optimal target of 5,000 cfs for 3 days. Metrics measured at Whiskeytown Dam.

Deliverables

Date	Title
Dec. 2017	Geomorphic evaluation report
Dec. 2017	Riparian vegetation evaluation report
Dec. 2017	Avian species evaluation report
Dec. 2017	Herpetofaunal species evaluation report
Dec. 2015	Operational Toolkit
Mar. 2016	Approval for pilot program from MP-RO, Dam Safety and Denver TSC
Dec. 2015	Revised Saftey of Dams analysis
Sep. 2015	Final 6 Technical Memos
Dec. 2015	Geomorphic evaluation report

Narrative

The construction of Whiskeytown Dam in 1963 blocked the natural movement of sediment, thereby reducing the amount of gravel for salmon and steelhead spawning habitat. Additionally, stream flows below Whiskeytown Dam have been highly modified and the regularly recurring higher flow level events have been curtailed. Stream flow magnitudes sufficient to promote geomorphic processes no longer occur as frequently prior to dam construction. The actions of this charter will promote more normative geomorphic processes to occur, resulting in channel maintenance flows, channel meander, mobilization of armored banks, gravel movement and re-deposition, and mobilization of fine sediments out of the system.

This charter is to re-operate Whiskeytown Dam to produce higher stream flows in Clear Creek, designed to create and maintain spawning and rearing habitat for salmon and steelhead. This action is required under NMFS OCAP BO RPA I.1.2. Costs are shared with a DFW ERP agreement with FWS for a pilot re-operation. This charter is separate from the Clear Creek flow charter which includes additional flow elements because 1) this charter is largely already funded by the State, 2) this charter has a separate and longer timeline from the Flow charter, 3) this charter has in the past been seen as a separate and stand alone project.

Data Management

Information for the charter including relevant protocols for understanding the information, will be permanently housed at Northern California Area Office of Reclamation and the Red Bluff Fish and Wildlife Office of the Service.

Risks

Risk	Likelihood	Impact
Funding reductions	2	3
Unanticipated stream impacts	1	2
Review of technical memos	3	3

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$205,378	$0	$205,378

Total Cost: $205,378

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - Geomorphic and biological monitoring before, during and after flow events will be used to evaluate if flow events are achieving desired outcomes.				
Agreement	$32,754	FWS	CVPRF	Post flow-event monitoring of physical changes in stream and floodplain
Agreement	$76,800	FWS	CVPRF	Herpetofaunna visual encounter surveys and habitat assessment to evaluate the impacts of flow program on special status species.
Agreement	$53,424	FWS	CVPRF	Riparian vegetation monitoring to evaluate benefit of flows on reducing encroachment
Agreement	$42,400	FWS	CVPRF	Avian monitoring to evaluate the impacts of flow program on special status species.

b12 Clear Creek Flows

Develop and implement a comprehensive flow program for salmon and steelhead in Clear Creek

Classification:	Improvement, Water Operations
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - Priority Document Table 5. Record ID 1540. NMFS Recovery Plan action. Record ID 1942. OCAP BO RPA action. Mandated by CVPIA.
Partners:	CDFW, CDWR, NMFS, BLM, NRCS, Point Blue Conservation Science, ESA
Related Programs:	EWP, CALFED, b3, CVPIA b2, NMFS-RP, NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	

Metrics

Name	Value	Units	Comment
b12: Variable flow target	0	acre-feet	B2 target
b12: Water Temperature Target	56	degrees	56 for spawning and 60 for holding SCS. Targets incorporates the number of days exceeding target.
3,250 cfs mean daily flow for one day	1	number of actions	CVPIA goal for channel maintenance flows: 3 successful re-operations within 10 years, with a minimum target of 3,250 cfs mean daily flow for one day, and an optimal target of 5,000 cfs for 3 days. Metrics measured at Whiskeytown Dam.

Deliverables

Date	Title
Dec. 2015	Operational Flow Management Plan Required by NMFS RPA #1.I.6
Mar. 2016	Comprehensive Flow Plan Required by CVPIA Section 3406(b)12
Dec. 2017	Channel Maintenance and Riparian Mangement Flow Recomendation
Apr. 2016	Spring Attraction Flow Annual Proposal
Dec. 2018	Adaptive Plan to Encourage Steelhead Anadromy within the Central Valley
Dec. 2016	Water Temperature Model Incorporating Trinity River, Sacramento River and Clear Creek Operations

Narrative

CVPIA is required to "develop and implement a comprehensive program to provide flows to allow sufficient spawning, incubation, rearing, and outmigration for salmon and steelhead from Whiskeytown Dam' Flows and temperatures must be provided and managed through releases from Whiskeytown Dam on a year-round basis to support the different life stages of salmon and steelhead in Clear Creek'. The amounts of water, considering timing, magnitude, and duration, and water temperature are controlled to meet this goal. Clear Creek Program objectives include: 1) provide minimum instream flows that create habitat that is at least 90 percent of the maximum possible, 2) provide temperature control flows to meet Igo gage water temperature criteria including 60°F from June 1 through September 15, and 56°F from September 15 through October 31, 3) provide annual adult attraction flows that result in 67 percent of adult spring Chinook being distributed upstream of the Igo gage and all being distributed upstream of the segregation weir, and 4) provide additional channel maintenance flows of 3,250 to 5,000 cfs in 3 years out of 10, to create and maintain the habitats upon which anadromous salmonids depend.

NMFS OCAP RPA I.1.6 requires that 'Reclamation will, in conjunction with the Clear Creek Technical Team, assess whether Clear Creek flows shall be further adapted to reduce adverse impacts on spring-run and CV steelhead and report their findings and proposed operational flows to NMFS'. The Clear Creek technical team plans to draft plans for adaptive management of steelhead anadromy in the Central Valley. BOR and FWS activities under this charter will be funded under the Clear Creek Program Management charter.

Data Management

Information for the charter including relevant protocols for understanding the information, will be permanently housed at Northern California Area Office of Reclamation and the Red Bluff Fish and Wildlife Office of the Service.

Risks

Risk	Likelihood	Impact
Very short timeline	3	2

Cost Estimate

Year	Fund	Total	BOR	FWS	DFW
2016	CVPRF	$9,874	$0	$9,874	$0
2016	SIK	$10,000	$0	$0	$10,000

Total Cost: $19,874

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Planning and Analysis - Planning stream flows and temperatures required by CVPIA and NMFS OCAP RPA's				
Labor	$9,874	FWS	CVPRF	Technical assistance in writing and implementing plans
In-Kind Labor	$10,000	DFW	SIK	Technical assistance in writing and implementing plan

b12 Clear Creek Stream Channel Restoration including Phase 3C

Improve stream channel, floodplain and associated habitats to provide increased spawning and rearing habitat for salmonids

Classification: Improvement, Habitat Restoration

Location: , Clear Creek

Funding Years: 2015 - 2016

Benefits Start Year: 2015

Priority: 2 - In 2016 Priority Document Table 4. Ongoing Actions. Record ID 91. AFRP Final Restoration Plan. Also a NMFS Recovery Plan action. Required under CVPIA section(b)12.

Partners: CDFW, CDWR, NMFS, BLM, Western Shasta Resource Conservation District, NRCS, Point Blue Conservation Science, NPS

Related Programs: CALFED, NMFS-RP, NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Restoration	100.0%	One-time modification of the channel.

Metrics

Name	Value	Units	Comment
b12: Area of spawning hab created annually	10000	square feet	This metric was originally a target of 347,288 square feet, not an annual target. Need to update spawning area metric with new contemporary methodology.
b12: Stream Channel restored (miles)	2	miles	CPAR goal was 2 miles for the entire program based on the length of the first stream channel restoration project proposal in 1999.Subsequent and projects currently under consideration could exceed metric value

Deliverables

Date	Title
Dec. 2017	Phase 3C Design, Estimating, and Construction and Value Engineering reviews
Mar. 2017	Phase 3C juvenile fish habitat evaluation
Sep. 2017	Phase 3C riparian and avian evaluations
Dec. 2017	Phase 3C designs and bid documents
Dec. 2015	Inventory riparian encroachment and restoration opportunities
Apr. 2018	Phase 3C Environmental documents and permits

Date	Title
Apr. 2018	Environmental documents and permits for Gorge Spawning Curve

Narrative

The Clear Creek Stream Channel Restoration project is a construction project designed to eliminate gravel extraction pits, restore a functional floodplain, and increase salmonid spawning and juvenile rearing habitat in a two-mile section of creek significantly degraded by gold and aggregate mining. Four phases of the project are complete including: Phase 1 in 1998, Phase 2A in 1999, Phase 2B in 2001, Phase 3A in 2002, Redding Bar in 2003 and Phase 3B in 2008. Phases 3A and 3B created new stream channels and the other phases filled gravel extraction pits, created and vegetated floodplain habitat and reduced most of the potential for fish stranding in the project area. ERP provides funding for Phase 3B, with roadwork and riparian stabilization work currently scheduled for implementation in FY 2015. Phase 3C would create floodplain and stream channels in the lowest part of the reach. On-going analyses of geomorphic function, fish and wildlife limiting factors and priorities, mercury contamination, landownership, and cost-effectiveness, plus an inventory of other restoration opportunities in the watershed, is expected to result in restoration recommendations for Phase 3C in FY 2015. Estimated cost for Phase 3C is $6.6M. Additional stream channel restoration projects to be considered for implementation include Paige Bar floodplain lowering ($200,000), Gorge Spawning Curve channel realignment ($100,000), and Shea Property berm removal.

Data Management

Information for the charter including relevant protocols for understanding the information, will be permanently housed at Northern California Area Office of Reclamation and the Red Bluff Fish and Wildlife Office of the Service.

Risks

Risk	Likelihood	Impact
Unable to acquire private property	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2017	CVPRF	$3,549,684	$3,525,000	$24,684
2018	CVPRF	$325,000	$125,000	$200,000
2016	CVPRF	$896,900	$850,000	$46,900
2019	CVPRF	$46,900	$0	$46,900

Total Cost: $4,818,485

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Design - Obtain designs and bid documents for construction of Phase 3C.				
Labor	$400,000	BOR	CVPRF	Includes analysis, design, estimates, data collection, and bids and specifications. Also uses unexpended $100,000 from 2015.
Placeholder	$150,000	BOR	CVPRF	If needed, Reclamation would perform design, estimating and construction (DEC) review and / or value study of project.
Environmental Compliance and Permitting - Obtain Environmental Compliance and Permitting documents for Phase 3C.				
Labor	$200,000	BOR	CVPRF	Obtain Environmental Compliance and Permitting for Phase 3C restoration project
Inventory/Reconnaissance - Collect and analyze geomorphic, fish, riparian vegetation, avian and mercury information to provide baselines for design and mitigation of Phase 3C, and to evaluate the effectiveness of habitat restoration.				
Agreement	$100,000	BOR	CVPRF	Pre-project riparian and avian surveys to provide baseline conditions for evaluation of impacts of project to target and non-target species
Labor	$46,900	FWS	CVPRF	Perform study on juvenile salmonid habitat use to provide baseline for evaluation of project salmon rearing habitat objectives and provide design information for Phase 3C.
2017				
Construction - Design, permit and build Gorge Spawning Curve channel realignment project.				
Agreement	$50,000	BOR	CVPRF	Implement Gorge Spawning Curve channel realignment project based on plans and permits developed in 2016
Construction - Permit and construct Paige Bar Floodplain Lowering Project.				
Agreement	$75,000	BOR	CVPRF	Conceptual designs provided under previous contract. Will require final plans and bid documents. Existing programmatic NEPA and ESA would need supplemental compliance.
Construction - Construct Phase 3C of Stream Channel Restoration Project				
Agreement	$2,700,000	BOR	CVPRF	Initial estimate of construction costs for Phase 3C Restoration Project

Type	Total	Agency	Fund	Description
Labor	$200,000	BOR	CVPRF	Construction management of Phase 3C channel restoration project using estimate of 1 FTE
Placeholder	$500,000	BOR	CVPRF	Contingency of approximately 20% for construction of Phase 3C
Planning and Analysis - Working with Clear Creek Technical Team to develop conceptual plans for restoration projects identified in inventory.				
Labor	$24,684	FWS	CVPRF	Work with Clear Creek Technical Team to develop conceptual plans for restoration projects identified in riparian habitat and restoration opportunity inventory.
2018				
Construction - Permit and construct Paige Bar Floodplain Lowering Project.				
Agreement	$125,000	BOR	CVPRF	Floodplain lowering and gravel augmentation project implementation using gravel processing onsite for cost savings.
Monitoring - Evaluate Phase 3C performance using geomorphic, fish, avian, riparian, herp and mercury monitoring.				
Agreement	$200,000	FWS	CVPRF	Supplemental funding for monitoring described in project proposal potentially including fish, geomorphological, avian, riparian,herpetological and mercury evaluations. Information will be used to evaluate the impacts and effectiveness of the project.
2019				
Monitoring - Evaluate Phase 3C performance using geomorphic, fish, avian, riparian, herp and mercury monitoring.				
Labor	$46,900	FWS	CVPRF	Perform post-project study on juvenile salmonid habitat use to evaluate salmon rearing objectives for Phase 3C.

b12 Lower Clear Cr Aquatic Habitat and Mercury Abatement Project

Mercury removal from historic mining tailings provides a long-term gravel supply to enhance spawning habitat in Clear Creek

Classification:	Improvement, Spawning Gravel
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - 2016 Priority Document Table 5. Record ID 1275. NMFS Recovery Plan action. Acquisition of a long term gravel supply, per RPA action I.1.3.
Partners:	CDWR, NMFS, BLM, Western Shasta Resource Conservation District, NRCS, Point Blue Conservation Science, CDFW
Related Programs:	CALFED, NMFS-RP, NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	Long-term gravel supply as part of the flows program.

Metrics

Name	Value	Units	Comment
b12: Stream Channel restored (miles)	1	miles	Project will restore floodplain and stream channel.
Gravel supplied	340000	tons	Project will provide long-term supply of gravel
Water quality	0	tons	Mercury sequestration will improve water quality in Clear Creek

Deliverables

Date	Title
Dec. 2017	Wetland Design
Dec. 2018	Geomorphic Evaluation Report
Dec. 2018	Construction Compliance Report
Dec. 2018	Fish Habitat Evalaution Report
Dec. 2018	Revegetation Report

Narrative

This project, formally known as the Lower Clear Creek Aquatic Habitat and Mercury Abatement Project, involves the reclamation and sequestration of mercury laden mining tailings along the streambanks of Clear Creek, CA. The mining tailings contain fine sediments which contain elemental mercury. The project will remove and contain the fine sediment in a clay-lined spoils pit, away from the 100-year flood plain. The remaining gravel will be stockpiled for future use in Clear Creek spawning gravel augmentation projects.

CVPIA provided funding for feasibility studies, designs and permits. The Ecosystem Restoration Program is providing $4.6M for implementation. CVPIA may cost share revegetation, wetlands creation, monitoring and evaluation of the project depending upon remaining ERP funds and the amount of remaining work. The project will be mitigated and monitored in accordance with regulatory agency monitoring requirements. Project implementation will begin in FY 2016, and continue through FY 2018.

Data Management

The information developed by this Charter will be housed at Reclamations Northern California Area Office (Shasta Dam, CA) ,the U.S. Fish and Wildlife Services Red Bluff Fish and Wildlife Office (Red Bluff, CA), the Bureau of Land Management Field Office in Redding, CA, and at the California Department of Fish and Wildlife Regional Headquarters in Redding, CA.

Risks

Risk	Likelihood	Impact
Funding reductions	1	3

Cost Estimate

Year	Fund	Total	BOR	FWS	DFW
2016	CVPRF	$26,000	$26,000	$0	$0
2016	SC	$2,250,000	$0	$0	$2,250,000
2017	CVPRF	$100,000	$100,000	$0	$0
2017	WRR	$10,500	$10,500	$0	$0
2018	CVPRF	$49,684	$25,000	$24,684	$0
2018	WRR	$25,000	$25,000	$0	$0
2019	CVPRF	$100,000	$100,000	$0	$0

Total Cost: $2,561,184

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation -				
Labor	$26,000	BOR	CVPRF	Assistance in project implementation from Reclamation staff.
In-Kind Agreement	$2,250,000	DFW	SC	2nd year of implementation
2017				
Implementation -				
Agreement	$50,000	BOR	CVPRF	Revegetation of uplands and riparian areas including surveys and desingns.
Labor	$10,500	BOR	WRR	Assistance in project implementation from Reclamation staff.
Agreement	$50,000	BOR	CVPRF	Provide wetlands construction designs including field surveys, and or provides partial funding for implementation.
2018				
Implementation -				
Agreement	$25,000	BOR	CVPRF	Post-project geomorphic monitoring and evaluation
Labor	$25,000	BOR	WRR	Project monitoring per regulatory agency requirements
Labor	$24,684	FWS	CVPRF	Monitoring to evaluate changes in stream habitat resulting from project actions.
2019				
Implementation -				
Placeholder	$100,000	BOR	CVPRF	Funding to fix problems with project (2% of overall $5M cost).

b1 Cosumnes River Adult Escapement and Juvenile Outmigration Monitoring

Cosumnes River Juvenile Outmigration Monitoring

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Consumnes River
Funding Years:	2014 - 2018
Benefits Start Year:	2014
Priority:	12 - This is priority monitoring to track the impact of recently completed fish passage and spawning habitat restoration projects funded by CVPIA and the Service's National Fish Passage Program.
Partners:	Fishery Foundation of California
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	

Metrics

Name	Value	Units	Comment
Population Assessment	1	number of reports	Project completes adult escapement and juvenile outmigration estimates annually.

Deliverables

Date	Title
Dec. 2016	FY16 Cosumnes River Escapement and Outmigration Annual Report

Narrative

This effort provides annual adult escapement, spawning and juvenile outmigration estimate for the Cosumnes River. AFRP and other project partners have contributed in the past to implementing passage projects that have made the entire naturally accessible portion of the river available, yet escapement, production and outmigration were not monitored for many years. This project not only provides a population and production estimate for the watershed, but also provides significant post-project monitoring for projects completed by AFRP and many of our partners in the last decade.

Data Management

All data collected as part of this project is stored by the Fishery Foundation of California and provided to AFRP staff electronically. Both FFC and USFWS keep secure electronic back up copies of the data.

Risks

Risk	Likelihood	Impact
Availability of 'extra' CDFW screw-trap	1	3

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$63,600	$0	$63,600
2017	CVPRF	$63,600	$0	$63,600

Total Cost: $127,200

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - Develop better annual juvenile outmigration and adult escapement estimates for the Cosumnes River and begin to compare those estimates in light of recent restoration and passage projects in the system.				
Agreement	$63,600	FWS	CVPRF	Grant provided to Fishery Foundation of California to complete escapement/spawning surveys and operate the CDFW rotary screw-trap they have been loaned (used to be funded to operate but CDFW can no longer support that effort annually).
2017				
Monitoring - Develop better annual juvenile outmigration and adult escapement estimates for the Cosumnes River and begin to compare those estimates in light of recent restoration and passage projects in the system.				
Agreement	$63,600	FWS	CVPRF	Grant provided to Fishery Foundation of California to complete escapement/spawning surveys and operate the CDFW rotary screw-trap they have been loaned (used to be funded to operate but CDFW can no longer support that effort annually).

b1 Henderson Park Channel & Floodplain Restoration

Snelling Channel and Floodplain Restoration Project at Henderson Park and subsequent study of post-implementation conditions

Classification: Improvement, Habitat Restoration

Location: , Merced River

Funding Years: 2015 - 2017

Benefits Start Year: 2015

Priority: 4 - This project represents a significant investment in a major ongoing habitat restoration project on the Merced River by AFRP (prioritized using previous framework). Final funding is needed to complete post-project monitoring, analysis of monitoring data, and the final project report.

Partners: Merced County, CDFW, Cramer Fish Sciences

Related Programs: NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Stream Channel Restored	1	miles	
Riparian Habitat Improvement	1	miles	

Deliverables

Date	Title
Mar. 2017	Annual summary report
Mar. 2017	Comprehensive final report
Dec. 2017	Draft peer-reviewed manuscript
Jul. 2015	Monthly progress reports
Aug. 2016	Construction summary report

Narrative

Funding is requested to complete: 1) final construction oversight,, 2) final construction summary report, 3) collection and analysis of post-project monitoring data, and 4) development of a draft peer-reviewed manuscript describing the effectiveness of the project in improving spawning and rearing conditions for salmonids in the Merced River.

Data Management

Project monitoring data will be stored electronically at the Lodi Fish and Wildlife Office.

Risks

Risk	Likelihood	Impact
Flood conditions	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$250,077	$0	$250,077

Total Cost: $250,077

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Management - Management of all project activities				
Agreement	$38,927	FWS	CVPRF	Management of all project activities
Monitoring - Includes fisheries monitoring to evaluate and demonstrate project effectiveness				
Agreement	$211,150	FWS	CVPRF	$109,554 is needed to complete post-project monitoring; an additional $89,644 is needed to complete analysis of the post-project monitoring data and the comprehensive final project report and manuscript.

b1 Merced River Instream & Off-Channel Drought-Resilient Habitat Rehabilitation

Large scale in-channel, floodplain and riparian habitat restoration project.

Classification:	Improvement, Habitat Restoration
Location:	, Merced River
Funding Years:	2015 - 2020
Benefits Start Year:	2016
Priority:	22 - Program Priority Comments: Project follows the successful implementation of the Merced River Ranch project immediately downstream and has received initial funding for design and permitting under the California Drought Response funding opportunities.
Partners:	MID, Cramer Fish Sciences, CDFW, CDWR
Related Programs:	California Drought Response

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Stream Channel Restored	1	miles	0.66 miles of river channel (value is rounded up to 1, as decimals not possible to enter)
Floodplain/Off-Channel/Riparian Corridor Improvements	27	acres	26.7 acres of riparian and upland habitat (value is rounded up to 27, as decimals not possible to enter)

Deliverables

Date	Title
Jul. 2018	2018 Annual Post-Project Monitoring Report (Effectiveness & Validation Monitoring)
Jan. 2016	Permitting & Environmental/Regulatory Compliance
Jan. 2016	Project Designs (from alternate funding source: CA Drought Response)
Feb. 2016	Restoration Monitoring Plan (Implementation, Effectiveness, & Validation Monitoring)
Oct. 2016	Construction Summary Report (As-Built Surveys/Implementation Monitoring)
Jul. 2017	2017 Annual Post-Project Monitoring Report (Effectiveness & Validation Monitoring)

Narrative

Initial analysis and design for this project has been funded (approximately $98,100) via California Drought Response Funding.

CVPIA Funding is requested in order to attain all necessary permitting requirements, and complete construction of this project, located just upstream of the Merced River Ranch Project (a recently completed, large-scale, AFRP project). Construction designs and all permitting requirements must be completed before onset of construction, which would occur in the summer of 2016. This project would rehabilitate spawning and rearing habitat for Chinook salmon and O. mykiss impacted by mining and other modifications to the natural geomorphological processes, and further exacerbated by the recent drought. To effectively meet these goals, this project will take into account the current managed flow regime of the lower river.

The Project goals are as follows:

- Augment, rehabilitate, and enhance productive Merced River juvenile salmonid rearing and adult spawning habitat that is resilient to drought conditions;

- Enhance juvenile salmonid access to historic floodplain habitat;

- Reduce main channel habitats potentially conducive to invasive fish species;

- Create additional flooding capacity, improving flood management in wet years

- Address goals of existing recovery plans and work synergistically with existing restoration efforts;

- Improve community opportunities to participate in, learn about, and support salmonid habitat restoration that is resilient to present and future drought conditions.

This project will generate a restoration design that will re-grade and rehabilitate approximately 26.7 acres of dredger tailings on the historic floodplain and 0.66 linear miles (13 acres) of in-channel salmonid spawning, incubation and rearing habitat in the lower Merced River. The floodplain will be graded and floodplain material will be screened to appropriate Chinook salmon and O. mykiss spawning size classes (¼ to 5 in. of round river rock, as per AFRP recommendations). The Project will create a variety of terrestrial and aquatic habitats, including oak grassland; floodplain; gravel bars; and side channels that function under a variety of flow conditions, including those that occurred over the recent drought period. These constructed features will support a variety of ecological services, including salmonid spawning and rearing habitats and improve water quality, including temperature and dissolved oxygen under low flow conditions.

Data Management

All data files and documents associated with permitting requirements, construction designs, agreements, etc., will be housed at USFWS Lodi Office.

Risks

Risk	Likelihood	Impact
Permitting related to surface mining (tailing pile processing) - should not be a significant issue as permitting process was worked out on Merced River Ranch project	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS	DFW
2016	CVPRF	$312,912	$0	$312,912	$0
2017	CVPRF	$296,800	$0	$296,800	$0
2018	CVPRF	$296,800	$0	$296,800	$0
2015		$98,100	$0	$0	$98,100

Total Cost: $1,004,612

Activities and Resources

Type	Total	Agency	Fund	Description
2015				
Planning and Analysis - CA Drought Funding for project analysis, design and initial permitting.				
Agreement	$98,100	DFW		Project received initial funding for analysis, design and initial permitting under CA Drought Funding initiative
2016				
Implementation - Permit, construct, and monitor the project (Year 1 of implementation).				
Agreement	$312,912	FWS	CVPRF	Designs funded in 2015 through a California state grant (drought funding), and are already in place for the project. AFRP to fund the cost of permitting (presumably), construction of the project in 2016, and development of a Monitoring Plan. Likely to be State contributions (amount unknown).

Type	Total	Agency	Fund	Description
2017				
Implementation - Continued project implementation in Year 2 for the project (if necessary): any undated/additional project designs, planning/permitting requirements, or any additional construction for the project.				
Agreement	$212,000	FWS	CVPRF	If needed in Year 2 (2017) of the project: any additional designs, permits/environmental compliance, or construction associated with the project first implemented in 2016. All assumed reporting (deliverable) costs included here. Likely to be State contributions (amount unknown).
Monitoring - Year 2 post-project monitoring				
Agreement	$84,800	FWS	CVPRF	Post-project monitoring (cont.) in Year 2 after the project was implemented (in 2016), and report on findings. Post-construction surveys, fish monitoring, and assessment of habitat quantity and quality. Likely to be State contributions (amount unknown).
2018				
Implementation - Continued project implementation in Year 3 for the project (if necessary): any undated/additional project designs, planning/permitting requirements, or any additional construction for the project.				
Agreement	$212,000	FWS	CVPRF	If needed in Year 2 (2017) of the project: any additional designs, permits/environmental compliance, or construction associated with the project first implemented in 2016. All assumed reporting (deliverable) costs included here. Likely to be State contributions (amount unknown).
Monitoring - Year 3 post-project monitoring				
Agreement	$84,800	FWS	CVPRF	Post-project monitoring (continued) in Year 3 (2018) after the project was implemented (in 2016), and report on findings. Post-construction surveys, fish monitoring, and assessment of habitat quantity and quality. Likely to be State contributions (amount unknown).

b1 Mokelumne Spawning Habitat Improvement

Mokelumne River Spawning Habitat Improvement

Classification:	Improvement, Spawning Gravel
Location:	, Mokelumne River
Funding Years:	2014 - 2018
Benefits Start Year:	2014
Priority:	7 - This project is the continuation of a long-term and highly effective partnership with East Bay Municipal Utility District. The project has had long-term success in significantly increasing the successful spawning and natural production of Chinook Salmon in the Mokelumne River, for a very cost-effective investment.
Partners:	EBMUD
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Spawning Gravel	3000	tons	Approximately 3000 tons of appropriately sized spawning gravel will be placed in the spawning area below Camanche Dam.

Deliverables

Date	Title
Dec. 2016	FY16 Mokelumne Spawning Gravel Project Annual Report
Dec. 2015	FY15 Mokelumne Spawning Gravel Project Annual Report

Narrative

The project will consist of continuing the long-term and highly successful spawning gravel introduction project with East Bay Municipal Utility District. CVPIA funds are generally put toward the location and purchase of appropriate gravel and EBMUD provides all funding required for project permitting and implementation. Due to limitations in locally available gravel, USFWS and EBMUD will be using part of the FY15 funding provided for this project to seek out and develop new local gravel sources. It is likely that some additional portion of the FY15 funding will be needed to complete these efforts. It is anticipated that the project will accomplish approximately half of the normal annual gravel introduction (3,000 tons vs. 6,000

tons) in FY15 and FY16, but it is possible that a larger amount will be used in FY16 if available after the FY15 project. Project will be proposed annually for funding through FY18 when a the current agreement will expire and a new one will need to be completed if assessment at that time shows a need for additional gravel introduction. This project is funded by b(1) as the Mokelumne River is not a CVP river. This project meets Action 2 for the Mokelumne River from the AFRP Final Restoration Plan.

Data Management

East Bay Municipal Utility District collects and manages all data related to this project and provides electronic copies to AFRP staff. Secure electronic data backups will be retained by EBMUD and USFWS.

Risks

Risk	Likelihood	Impact
Gravel Availability	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS	Local
2016		$87,500	$0	$0	$87,500
2016	CVPRF	$106,000	$0	$106,000	$0
2017		$87,500	$0	$0	$87,500
2017	CVPRF	$106,000	$0	$106,000	$0
2018	CVPRF	$106,000	$0	$106,000	$0
2018		$87,500	$0	$0	$87,500

Total Cost: $580,500

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation - Project will further develop local gravel sources and implement spawning gravel improvement.				
Direct Contribution	$25,000	Local		
Agreement	$106,000	FWS	CVPRF	Funding will be provided to partner with EBMUD on development of a new local gravel source and implement spawning gravel improvement. EBMUD will contribute $87,500 of combined direct and in-kind match (e.g.

Type	Total	Agency	Fund	Description
				gravel recovery, gravel placement, project oversight, pre- and post-project monitoring).
In-Kind Labor	$62,500	Local		
2017				
Implementation - Project will further develop local gravel sources and implement spawning gravel improvement.				
In-Kind Labor	$62,500	Local		
Direct Contribution	$25,000	Local		
Agreement	$106,000	FWS	CVPRF	Funding will be provided to partner with EBMUD on development of a new local gravel source and implement spawning gravel improvement. EBMUD will contribute $87,500 of combined direct and in-kind match (e.g. gravel recovery, gravel placement, project oversight, pre- and post-project monitoring).
2018				
Implementation - Project will further develop local gravel sources and implement spawning gravel improvement.				
Agreement	$106,000	FWS	CVPRF	Funding will be provided to partner with EBMUD on development of a new local gravel source and implement spawning gravel improvement. EBMUD will contribute $87,500 of combined direct and in-kind match (e.g. gravel recovery, gravel placement, project oversight, pre- and post-project monitoring).
In-Kind Labor	$62,500	Local		
Direct Contribution	$25,000	Local		

Delta Salmon Survival Study

Study to assess the survival of juvenile Chinook salmon through the Delta

Classification: Performance Monitoring, Performance Monitoring

Location: , Sacramento-San Joaquin Delta

Funding Years: 2014 - 2018

Benefits Start Year: 2015

Priority: 2 - Program Priority Comments:

Partners: USGS, USBR

Related Programs: BDCP, San Joaquin River Restoration Program, NMFS-RP, CDWR

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Analyzes the effectiveness of Head of Old River Barrier on survival. Determines the effectiveness of (b)(2) water operations and management of Stanislaus River and other SJR basin flows

Metrics

Name	Value	Units	Comment
Annual survival report	1	number of reports	

Deliverables

Date	Title
Nov. 2016	2015 Delta Survival Study Report
Nov. 2017	2016 Delta Survival Study Report

Narrative

Continuation of a study to assess the survival of juvenile salmon as they pass through the Delta, and how different water management actions affect juvenile salmon passage. The data from the study can be used to manage river discharges so juvenile salmon are more successful in passing through the Delta as they migrate to the Pacific Ocean. Increased juvenile salmon passage through the Delta should, in turn, lead to greater numbers of adult salmon that return to their natal watersheds when they spawn. In years when the Head of Old River barrier is in place, this assessment can also be used to determine whether there are benefits of the barrier installation, or not.

Data Management

Data is provided and tabulated in an annual report. Raw data is stored and maintained by the analyst and is made available to CVPIA staff as requested.

Risks

Risk	Likelihood	Impact
Hiring/staffing limitations within USFWS	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2015	CVPRF	$173,960	$0	$173,960
2016	CVPRF	$640,128	$0	$640,128
2017	CVPRF	$984,568	$0	$984,568
2018	CVPRF	$1,026,008	$0	$1,026,008

Total Cost: $2,824,664

Activities and Resources

Type	Total	Agency	Fund	Description
2015				
Research -				
	$173,960	FWS	CVPRF	Partial funding to conduct the Delta Survival Study led by Pat Brandes. The total project is expected to cost $400,000 in FY2015. The CAMP does not currently plan to fund this project in FY2016. The b16 program will provide $23,960 to fund the project, and the b2 program will provide $150,000.
2016				
Research -				
Equipment or Materials	$412,128	FWS	CVPRF	Acoustic tags to be implanted in fish that are part of this assessment
Labor	$122,000	FWS	CVPRF	FTE consists of multiple permanent and temporary FWS staff needed to implement the project
Agreement	$106,000	FWS	CVPRF	Continuation of existing USFWS agreement with University of Washington for data analysis.

Type	Total	Agency	Fund	Description
2017				
Research -				
Equipment or Materials	$431,568	FWS	CVPRF	Based on FY16 tag cost, plus 5% to account for inflation.
Labor	$124,000	FWS	CVPRF	Based on FY16 labor estimate, plus 2% to account for inflation.
Agreement	$318,000	FWS	CVPRF	To implement study in FY17, the acoustic receiver array currently deployed through USBR for the ongoing 6-year study would need to be deployed. The 6-year study array will no longer be deployed after the end of 2016, necessitating additional funding to deploy the array in FY17.
Agreement	$111,000	FWS	CVPRF	Based on FY16 cost estimate, plus 5% to account for inflation.
2018				
Research -				
Equipment or Materials	$451,008	FWS	CVPRF	Based on FY17 estimated tag cost, plus 5% to account for inflation.
Agreement	$116,000	FWS	CVPRF	Based on FY17 cost estimate, plus 5% to account for inflation.
Labor	$126,000	FWS	CVPRF	Based on FY17 labor estimate, plus 2% to account for inflation.
Agreement	$333,000	FWS	CVPRF	Based on FY17 cost estimate, plus 5% to account for inflation.

b1 Green Sturgeon Juvenile Investigation

Green Sturgeon Juvenile Overwintering Migration Investigation

Classification: Reconnaissance, Reconnaissance

Location: , Sacramento Upper Mainstem

Funding Years: 2014 - 2018

Benefits Start Year: 2014

Priority: 10 - Very little is known about the early life history of green sturgeon so this project is a high priority. Collecting data will help to protect and recover this Threatened species.

Partners: USACE

Related Programs: NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	This initial study is meant to identify and characterize habitats used by juvenile green sturgeon so that potential habitat restoration actions can be developed to benefit the species, if possible. Long-term monitoring does not currently occur, but may be warranted depending on the outcome of this effort.

Metrics

Name	Value	Units	Comment
Population Assessment	1	number of reports	

Deliverables

Date	Title
Sep. 2016	Annual Report
Sep. 2017	Annual Report
Sep. 2018	Annual Report
Sep. 2019	Final Report
Sep. 2015	Annual Report

Narrative

The primary objective is to determine if Sacramento River Green Sturgeon juvenile fish exhibit a secondary migration pattern during the fall to overwintering habitat lower in the river or in the Delta. RBFWO staff will determine when and where “age 0” larvae migrate out of the upper

Sacramento River and at what size. Data will result in the acquisition of critical life history information for population recovery planning and provide data to make better informed decisions on the effects of flow management, diversions and potential habitat restoration actions for a Threatened species.

This pilot project will utilize the skills of 6 biologists/technicians working on this at a very small FTE each (i.e. 6 biologists/techs at two hours each day that sampling occurs). The staff will also be working on several other collateral monitoring efforts.

This project is considered a (b)(1) 'appropriate for project development' and meets Evaluation 10 for the Upper Sacramento River in the AFRP Final Restoration Plan. It is not a (b)(16) long-term research action. This pilot project would acquire gear and begin sampling in mid-August 2014. In early FY15, a gear-type comparison would be performed to evaluate the feasibility of capturing juvenile Green Sturgeon for future acoustic tagging efforts. Throughout FY 15 to FY18, sampling of 'age 0' fish would occur. The Army Corps of Engineers may also become a supporter and collaborater. In the future, as a follow-up to this pilot project, additional funding sources may be sought.

This project will help address one of the significant data gaps identified during the development of the sturgeon-specific decision support model. Anecdotal information suggests that juvenile green sturgeon may either migrate to the Bay/Delta within their first year of life or may remain higher in the Sacramento River for extended time periods. This study will document the occurrence and potentially the frequency and duration of these two different life-history strategies which will in turn provide significantly better estimates of survival and population dynamics to be incorporated into the modeling efforts.

Data Management

Information developed by this charter will be stored at the USFWS Red Bluff Fish & Wildlife Office website: http://www.fws.gov/redbluff/

Risks

Risk	Likelihood	Impact
Attaining research permits	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$111,127	$0	$111,127
2017	CVPRF	$113,155	$0	$113,155
2018	CVPRF	$115,222	$0	$115,222

Total Cost: $339,504

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Research - Collecting data to learn more about the life history patterns of green sturgeon.				
Labor	$101,367	FWS	CVPRF	Based on RBFWO estimated FY16 FTE rate. Will consist of small portions of time from multiple RBFWO staff
Equipment or Materials	$9,760	FWS	CVPRF	Field equipment and additional support materials
2017				
Research - Collecting data to learn more about the life history patterns of green sturgeon.				
Labor	$103,395	FWS	CVPRF	Based on RBFWO estimated FY16 FTE rate plus 2%. Will consist of small portions of time from multiple RBFWO staff
Equipment or Materials	$9,760	FWS	CVPRF	Field equipment and additional support materials
2018				
Research - Collecting data to learn more about the life history patterns of green sturgeon.				
Labor	$105,462	FWS	CVPRF	Based on RBFWO estimated FY17 FTE rate plus 2%. Will consist of small portions of time from multiple RBFWO staff
Equipment or Materials	$9,760	FWS	CVPRF	Field equipment and additional support materials

b1 Sacramento River Redd & Life History Monitoring

Study to assess the impacts of flow management in the upper Sacramento River on salmonid redds and juveniles. Information is used to inform managers of potential impacts, assess current habitat availability/limitations and potentially design future habitat restoration actions.

Classification:	Reconnaissance, Reconnaissance
Location:	, Sacramento Upper Mainstem
Funding Years:	2012 - 2017
Benefits Start Year:	2014
Priority:	5 - Highest priority for Upper Sacramento Basin HRCs
Partners:	FWS, CDFW, Pacific States Marine Fisheries Commission
Related Programs:	NMFS-RP, EWP

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	High priority data related to flow management, existing spawning and rearing habitat and potential habitat restoration actions to be assessed. Initial results indicate that longer-term monitoring of this type is warranted and would be appropriate for consideration through the (b)(16) provision.

Metrics

Name	Value	Units	Comment
Stream miles monitored	70	miles	

Deliverables

No Data.

Narrative

The purpose of this study is to better determine the present day impacts of flow reductions on fish and aquatic habitats within the first seventy miles of the mainstem Sacramento River downstream of Keswick Dam. The data is relayed to managers on a relatively real time basis (weekly, or seasonal). Real time monitoring of redd dewatering and stranding due to flow reduction is beneficial to managers to assist decision making based on actual conditions on the river. The timing of flow reductions can often be critical to the survival of large numbers of eggs or juveniles. Up-to-date information can provide fishery managers with the assurances they need to make decisions to mitigate flow changes, if the data shows that the biological consequences will be significant.

Stable and continous river flows are important to the early life history (egg incubation to emergence from the gravel) of salmonids. If redds are dewatered or exposed to warm, deoxygenated water, incubating eggs/larval fish may not survive. After emergence from their redd, juvenile salmon can become stranded in shallow isolated water and be exposed to the same poor environmental conditions as well as increased predation. For the eggs and juveniles to survive they need water, of a suitable temperature, velocity and water quality, at all times.

Data on redd dewatering and juvenile stranding is being collected to aid management of flow releases from Keswick Dam. Real time monitoring of redd dewatering and stranding due to flow reductions is beneficial to managers to assist daily decision making based on actual conditions in the river. The timing of flow reductions can often be critical to the survival of large numbers of naturally spawned eggs or juveniles. Up-to-date information can provide fishery managers with the assurances they need to make desisions to mitigate flow changes, if the data shows that the biological consequences will be significant.

The AFRP program originally funded this project for three years of pilot level monitoring. In FY12, a full scale project was funded under a five-year Cooperative Agreement with Pacific States Marine Fish Commission (PSMFC). The full scale project is funded with a combination of b (1) and b (2) funding due to the amounts available in each program's overall budget and the need to continue collection of this valuable information. Future funding could potentially come from other CVPIA programs if those are deemed a better option (i.e. after FY 17). Additionally, results of this monitoring may be used to develop b(1) appropriate projects related to juvenile habitat restoration.

This study meets the intent of Action 2 for the Upper Mainstem Sacramento River as identified in the AFRP Final Restoration Plan.

Data Management

The final reports for this project will be available at: http://www.calfish.org/Programs/ProgramIndex/CDFGUpperSacRiverBasinSalmonidMonitoring/tabid/222/Default.aspx

Risks

Risk	Likelihood	Impact
Monitoring in a stream that fluctuates on an annual basis based on the type of water year	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$136,740	$0	$136,740
2017	CVPRF	$136,740	$0	$136,740

Total Cost: $273,480

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - 2016 Monitoring of naturally produced salmon redds and early life history in the upper 70 miles of the Sacramento River.				
Agreement	$136,740	FWS	CVPRF	AFRP agreement to monitor and assess water operation impacts and associated habitat condition/availability. Agreement is directly with Pacific States Marine Fisheries Commission and work is coordinated with CDFW Region 1.
2017				
Monitoring - 2017 Monitoring of naturally produced salmon redds and early life history in the upper 70 miles of the Sacramento River.				
Agreement	$136,740	FWS	CVPRF	AFRP agreement to monitor and assess water operation impacts and associated habitat condition/availability. Agreement is directly with Pacific States Marine Fisheries Commission and work is coordinated with CDFW Region 1.

Sacramento River Habitat Restoration at Anderson River Park

Salmonid Habitat Improvement at Anderson River Park. Includes side channel restoration and floodplain enhancement at a large gravel bar adjacent to the City of Anderson. Property is State owned and managed by City of Anderson. Both are supportive.

Classification:	Improvement, Habitat Restoration
Location:	40.46591, -122.25707, Sacramento Upper Mainstem
Funding Years:	2015 - 2018
Benefits Start Year:	2016
Priority:	- Program Priority Comments:
Partners:	NMFS, USACE, Glenn Colusa Irrigation District, Golden Gate Salmon Association, Western Shasta Resource Conservation District, City of Anderson, CA, CDFW, CDWR
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(13) Gravel	100.0%	

Metrics

Name	Value	Units	Comment
Acres of New Habitat	9	acres	Assumed 4,000 feet of side channel 100 feet wide to encompass side channel and floodplain habitat improvements.

Deliverables

Date	Title
Dec. 2016	Sacramento River at Anderson River Park Restoration

Narrative

This salmonid habitat restoration project would target primarily the improvement in juvenile Chinook salmon rearing habitat along a one mile stretch of the Sacramento River adjacent to the City of Anderson. The site is on an inside bend of a meander in the Sac River and consists of a large connected side channel on the downstream side which is not connected at the upstream end. The project would connect the side channel and add additional side channel habitat through this large gravel bar. Channel-side habitat would be designed to become incrementally wetted as river flows increase to attempt to provide habitat over a range of flows. Woody material would be integrated into the project to enhance habitat value. The site is state owned and managed by City of Anderson. Both are supportive of the project. The area is a public recreation area used

primarily by hikers and horseback riders. Funding includes design, implementation, and monitoring. IF FULL FUNDING CANNOT BE PROVIDED IN A SINGLE YEAR THEN PARTIAL OR INCREMENTAL FUNDING COULD BE INCORPORATED.

Data Management

Data at USBR Bay Delta Office and USFWS Bay Delta Office and USBR Northern California Area Office.

Risks

Risk	Likelihood	Impact
Project not implemented due to permitting red tape or other issues	2	2
Agency concern over channel and riparian effects	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$1,700,000	$1,700,000	$0
2017	CVPRF	$75,000	$75,000	$0

Total Cost: $1,775,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation - Includes project design, permitting, implementation, and monitoring.				
Agreement	$1,700,000	BOR	CVPRF	Cooperative agreement used to fund project implementation (permitting, design, implementation, monitoring).
2017				
Implementation - Includes project design, permitting, implementation, and monitoring.				
Agreement	$75,000	BOR	CVPRF	Project effectiveness monitoring.

Sacramento River Salmonid Habitat Additional Project at one of five sites

Sacramento River Habitat Improvement at Turtle Bay, Kapusta, Sand Slough, or Lower Cypress. Permitting is underway at all of these sites. This charter would implement a project at one of these top priority sites.

Classification:	Improvement, Habitat Restoration
Location:	40.59045, -122.36818, Sacramento Upper Mainstem
Funding Years:	2015 - 2018
Benefits Start Year:	2017
Priority:	- Program Priority Comments:
Partners:	NMFS, Glenn Colusa Irrigation District, Golden Gate Salmon Association, Western Shasta Resource Conservation District, CDFW, CDWR
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(13) Gravel	100.0%	

Metrics

Name	Value	Units	Comment
Increase in habitat	0	acres	Acreage varies depending on project site selected to implement first.

Deliverables

Date	Title
Apr. 2017	Habitat project completed

Narrative

This charter implements an additional salmonid habitat imporvement project site from those permitted under the program permitting document for the Sacramento River between Keswick and Red Bluff. Likely sites prioritized as high by the interagency group include Turtle Bay Island side channels, lower Cypress side channel and gravel, Kapusta side channel and gravel, Sand Slough rearing habitat. Funding would include permitting, design, implementation, and monitoring.

Data Management

Data housed at USBR Bay Delta Office, USFWS Bay Delta Office, and Northern California Area Office

Risks

Risk	Likelihood	Impact
Agency or public concern over channel and riparian effects	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$600,000	$600,000	$0
2017	CVPRF	$700,000	$700,000	$0
2018	CVPRF	$750,000	$750,000	$0

Total Cost: $2,050,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation - Includes project design, permitting, implementation, and monitoring.				
Agreement	$600,000	BOR	CVPRF	Cooperative agreement to work with the agencies in implementing the project.
2017				
Implementation - Includes project design, permitting, implementation, and monitoring.				
Agreement	$700,000	BOR	CVPRF	Implements a spawning and rearing habitat enhancement project at one of the top priority sites identified by the interagency group.
2018				
Implementation - Includes project design, permitting, implementation, and monitoring.				
Agreement	$750,000	BOR	CVPRF	Cooperative agreement to implement a spawning and rearing habitat enhancement project at one of the top priority sites identified by the interagency group.

Sacramento River Salmonid Habitat Restoration at Reading/Rancheria Island

Sacramento River Habitat Restoration at Reading and Rancheria Islands.

Classification:	Improvement, Habitat Restoration
Location:	40.41333, -122.19425, Sacramento Upper Mainstem
Funding Years:	2015 - 2018
Benefits Start Year:	2017
Priority:	3 - Program Priority Comments:
Partners:	No Data.
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(13) Gravel	100.0%	

Metrics

Name	Value	Units	Comment
Increase in Habitat	27	acres	Assumed 11,600 feet of side channel habitat 100' wide.

Deliverables

Date	Title
Mar. 2017	Completed project

Narrative

The project would reopen a side channel that historically flowed between river miles 274 and 276. The upstream end of the side channel was filled to provide access to Rancherie Island. This project would be implemented in cooperation with the landowner to reopen the upstream connection to the river providing perennial flow through the side channel. Funding for a bridge would be provided to the landowner so that access can be continued to this portion of the property. The side channel is currently wetted by the backwater from the Sacramento River and is full of aquatic vegetation and is likely good habitat for bass and other warmwater species. Perennial flow through the channel should remove much of the vegetation and provide cold water for juvenile salmonid rearing. The landowner has an agent with a draft restoration plan and is cooperative. Funding would be used for permitting, design, implementation, and monitoring. IF FULL FUNDING CANNOT BE PROVIDED IN A SINGLE YEAR THEN PARTIAL OR INCREMENTAL FUNDING COULD BE INCORPORATED.

Data Management

Data housed at USBR Bay Delta Office, USFWS Bay Delta Office, and Northern California Area Office.

Risks

Risk	Likelihood	Impact
Concern over effects to channel.	2	2
Landowner agreement not finalized	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$1,450,000	$1,450,000	$0
2017	CVPRF	$1,450,000	$1,450,000	$0
2018	CVPRF	$75,000	$75,000	$0

Total Cost: $2,975,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Implementation - Complete project designs and permits, construct the project, and monitor effectiveness.				
Agreement	$1,450,000	BOR	CVPRF	Cooperative Agreeement to implement the project. Agreement with Western Shasta Resource Conservation District or the Landowner. May involve more than one agreement.
2017				
Implementation - Complete project designs and permits, construct the project, and monitor effectiveness.				
Labor	$1,450,000	BOR	CVPRF	Carryover funding request to 2017 since funding unlikely for 2016.
2018				
Implementation - Complete project designs and permits, construct the project, and monitor effectiveness.				
Agreement	$75,000	BOR	CVPRF	Effectiveness monitoring of restoration site.

Sacramento River Salmonid Spawning and Rearing Habitat Restoration

Implements a series of salmonid spawning and rearing habitat improvement projects in the reach from Keswick Dam to Red Bluff.

Classification: Improvement, Habitat Restoration

Location: , Sacramento Upper Mainstem

Funding Years: 2014 - 2021

Benefits Start Year: 2015

Priority: 2 -

Partners: NMFS, USACE, Glenn Colusa Irrigation District, Golden Gate Salmon Association, Western Shasta Resource Conservation District, CDFW, CDWR

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(13) Gravel	100.0%	

Metrics

Name	Value	Units	Comment
b13: Sacramento R: percentage of spawning salmonids using placed gravel	0	redds/sq. meter	Units should be percent of total redds.
Increase in preferred habitat	4	acres	Value varies by project site

Deliverables

Date	Title
Nov. 2014	NEPA document done
Sep. 2015	First year project site completed
Sep. 2016	Second year project site completed

Narrative

Implements the annual salmonid spawning and rearing habitat restoration project on the Sacramento River in the reach between Keswick Dam and Red Bluff Diversion Dam. Activities include side channel creation and enhancement, gravel placement, floodplain enhancement, woody material and boulder additions, permitting, and effectiveness monitoring. Monitoring includes riverwide monitoring and site specific monitoring before, during, and after implementation at treatment and control sites. Likely base 2016 project sites include Keswick,

Market Street, south Cypress, and/or Kapusta. Annual project sites are prioritized within the interagency team working on the Sacramento River projects.

Data Management

Data maintained by USBR and USFWS project managers and will be disseminated in annual reports.

Contacts: John Hannon at the Reclamation Bay Delta Office, and Julie Zimmerman at the USFWS Bay Delta Office. Paul Zedonis at the Northern California Area Office.

Risks

Risk	Likelihood	Impact
Cost Share agreement	2	2
Flows and fish timing windows do not allow for instream work to occur.	2	2
Complex permitting processes add time and cost.	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2015	CVPRF	$1,600,000	$1,600,000	$0
2016	CVPRF	$600,000	$600,000	$0
2017	CVPRF	$956,000	$956,000	$0
2018	CVPRF	$1,650,000	$1,650,000	$0

Total Cost: $4,806,000

Activities and Resources

Type	Total	Agency	Fund	Description
2015				
Implementation - Implement annual salmonid spawning and rearing habitat improvement project to include design, env. compliance and permitting and pre- and post-project monitoring to determine effectiveness.				
Labor	$1,600,000	BOR	CVPRF	Implements an in-river project including side channel habitat and gravel.

Type	Total	Agency	Fund	Description
2016				
Implementation - Implement annual salmonid spawning and rearing habitat improvement project to include design, env. compliance and permitting and pre- and post-project monitoring to determine effectiveness.				
Labor	$600,000	BOR	CVPRF	Implements an in-river project including side channel habitat and gravel.
2017				
Implementation - Implement annual salmonid spawning and rearing habitat improvement project to include design, env. compliance and permitting and pre- and post-project monitoring to determine effectiveness.				
Agreement	$956,000	BOR	CVPRF	Implement annual salmonid spawning and rearing habitat improvement project to include design, env. compliance and permitting and pre- and post-project monitoring to determine effectiveness.
2018				
Implementation - Implement annual salmonid spawning and rearing habitat improvement project to include design, env. compliance and permitting and pre- and post-project monitoring to determine effectiveness.				
Agreement	$1,650,000	BOR	CVPRF	Implements a high priority Spawning and Rearing Habitat Enhancement Project in the Sacramento River.

Quantify adult winter-run Chinook salmon escapement on the Sacramento River

Quantify production (escapement) of adult winter-run Chinook salmon on the Sacramento River mainstem.

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Sacramento Upper Mainstem
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - This charter received a Program Priority = 2 value because it was initially classified as an unfunded need because it could not be funded using the original FY 2016 CAMP President's budget. Based on an annual work plan prioritization process, it was subsequently determined this project would receive CAMP funding because that program will receive additional funds over and above its initial President's budget allocation.
Partners:	CDFW
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	The proposed project would be funded using the (b)(16) CAMP authority, but the project would not be conducted by CAMP staff.

Metrics

Name	Value	Units	Comment
annual escapement survey report	0	number of fish	The data would be used to assess progress toward the AFRP winter-run Chinook salmon production target for the Sacramento River.

Deliverables

Date	Title
May. 2017	escapement annual report

Narrative

Collection of adult winter-run Chinook salmon escapement montitoring data from the Sacramento River is needed to assess progress toward the AFRP doubling goal. The project also is a required monitoring activity in in the OCAP biological opinion.

Data Management

The escapement data are stored in a digital Excel spreadsheet and the final results are ultimately stored in the Chinookprod database.

Risks

Risk	Likelihood	Impact
Lack of funding that would adversely affect the ability to conduct the survey	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$199,944	$0	$199,944

Total Cost: $199,944

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Labor	$199,944	FWS	CVPRF	Project costs and FTEs may need to be updated. The funding would be used to hire USFWS staff in the Red Bluff Fish and Wildlife Office through a cooperative agreement between the USFWS and BOR.

Sacramento River - Red Bluff Diversion Dam rotary screw trap monitoring

Quantify the production of juvenile Chinook salmon passing the Red Bluff Diversion Dam on the Sacramento River.

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Sacramento Upper Mainstem
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	2 - This charter received a Program Priority = 2 value because it was initially classified as an unfunded need because it could not be funded using the original FY 2016 CAMP President's budget. Based on an annual work plan prioritization process, it was subsequently determined this project would receive CAMP funding because that program will receive additional funds over and above its initial President's budget allocation.
Partners:	No Data.
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	The proposed project would be funded using the (b)(16) CAMP authority, but the project would not be conducted by CAMP staff.

Metrics

Name	Value	Units	Comment
count of juvenile salmon	0	number of fish	annual Red Bluff Diversion Dam rotary screw trap report

Deliverables

Date	Title
Dec. 2016	annual Red Bluff Diversion Dam rotary screw trap report

Narrative

Monitoring of juvenile salmon production on the Sacramento River provides fundamental data that are necessary to assess the biological response to habitat restoration activities. The project occurs in a CVP watershed. The project is a required element in the OCAP biological opinion.

Data Management

The Sacramento River rotary screw trap data will be stored in the CAMP rotary screw trap platform. Data summaries from that plaform can be provided to CVPIA managers, stakeholders and the public. The RST data will also be stored in a database maintained by USFWS staff in the Red Bluff Fish and Wildlife office.

Risks

Risk	Likelihood	Impact
Delay in the provision of funds to conduct the monitoring	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$802,243	$0	$802,243

Total Cost: $802,243

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Labor	$802,243	FWS	CVPRF	Project costs and FTEs may need to be updated. The funding would be used to hire USFWS staff in the Red Bluff Fish and Wildlife Office through a cooperative agreement between the USFWS and BOR.

TFFIP Implementation

Tracy Fish Facility Improvement Program (TFFIP) Implementation Activities

Classification: Improvement, Administration

Location: , Sacramento-San Joaquin Delta

Funding Years: 2015 - 2016

Benefits Start Year: 2015

Priority: 1 - Program Priority Comments:

CVPIA (b)(4) metrics coincide with OCAP Biological Opinions

Partners: NMFS, FWS, CDFW, CDWR

Related Programs: NMFS-RPAs, BDCP

Authority

Provision	Percentage	Comment
(b)(4) Tracy	100.0%	

Metrics

Name	Value	Units	Comment
Mitigation Actions	0	number of projects	b4: # Actions to mitigate for fishery impacts
RPA's	0	number of actions	b4: RPA IV.4.1
Structural Actions	0	completion	b4: Complete 1 of 23 structural actions for the CVPIA Program. This is defined as completing all 23 actions in the CPAR goal.

Deliverables

Date	Title
Sep. 2016	FY16 Draft Research Proposals
Sep. 2016	FY16 Comments provided to PI
Sep. 2016	FY16 Technical Team Workshop
Sep. 2016	FY16 Completion of Major Construction
Sep. 2016	FY16 Submit Final Proposals
Sep. 2016	FY16 Final Study Packet
Sep. 2016	FY16 2nd Technical Team Workshop
Sep. 2016	FY16 Publication Submittals
Sep. 2017	FY16 Draft Research Proposals
Sep. 2017	FY17 Comments provided to PI
Sep. 2017	FY17 Technical Team Workshop

Date	Title
Sep. 2017	FY17 Completion of Major Construction
Sep. 2017	FY17 Submit Final Proposals
Sep. 2017	FY17 Final Study Packet
Sep. 2017	FY17 2nd Technical Team Workshop
Sep. 2017	FY17 Publication Submittals

Narrative

This action consists of project development and implementation new fish collection, holding, transport, and release technology that will significantly improve fish protection at major water diversions in the South Delta region of the Central Valley of California. These research activities are funded by the Tracy Fish Facility Improvement Program (TFFIP) and are primarily performed by Reclamation fishery scientists and engineers at the Denver Technical Service Center and the TFCF, Tracy, California. Project selection will be based on project costs and benefits, and integration with regulatory requirements. Draft Proposals will be submitted in May 2015.

Data Management

Data will be retained by the Tracy Fish Facility Improvement Progam, SCCAO-Tracy. Finalized Study Plans, Tracy Series Reports ,Tracy Technical Bulletins, Hydraulic Laboratory Technical Memos are maintained at Tracy Research Website | http://www.usbr.gov/mp/tffip

Annual work plans and CVPIA program-level reports are maintained MPRO

Risks

No Data.

Cost Estimate

Year	Fund	Total	BOR	FWS	
2016	WRR	$430,066	$430,066	$0	$0
2017	WRR	$295,570	$295,570	$0	$0
2017		$10,000	$10,000	$0	$0
0		$0	$0	$0	$0

Total Cost: $735,637

Activities and Resources

Type	Total	Agency	Fund	Description
0				
Reporting - Applied Research - Predation				
	$0			
2016				
Design - Design - New Federal Fish Release Site				
Labor	$3,203	BOR	WRR	Tracy Office
Labor	$27,816	BOR	WRR	Denver Technical Services
Implementation - Equipment Maintenance				
Labor	$5,043	BOR	WRR	Tracy Office
Labor	$23,762	BOR	WRR	Tracy Office
Labor	$5,853	BOR	WRR	Tracy Office
Planning and Analysis - Research Proposals and Study Packets				
Labor	$26,054	BOR	WRR	Tracy Office
Labor	$17,616	BOR	WRR	Tracy Office
Planning and Analysis - Secondary Fish Screen (Newly constructed) Reference Hydrology				
Labor	$10,000	BOR	WRR	Denver Technical Services
Reporting - Publication - Tracy Technical Series and Fisheries Journal submittals				
Labor	$17,617	BOR	WRR	Tracy Office
Labor	$26,054	BOR	WRR	Tracy Office
Research - Applied Research - Facility Efficiency				
Labor	$57,655	BOR	WRR	Tracy Office
Labor	$22,996	BOR	WRR	Tracy Office
Research - Applied Research - Predation				
Labor	$20,000	BOR	WRR	Denver Technical Service
Labor	$64,061	BOR	WRR	Tracy Office
Labor	$14,215	BOR	WRR	Tracy Office
Research - Applied Research - Facility Effiency				
Labor	$27,360	BOR	WRR	Denver Technical Service
Labor	$2,970	BOR	WRR	Denver Technical Service
Research - Applied Research - Fish Handling				
Labor	$15,840	BOR	WRR	Denver Technical Service
Labor	$31,776	BOR	WRR	Tracy Office
Labor	$2,970	BOR	WRR	Denver Technical Service

Type	Total	Agency	Fund	Description
Labor	$7,207	BOR	WRR	Tracy Office
2017				
Design - Design - New Federal Fish Release Site				
Labor	$27,816	BOR	WRR	Denver Technical Service
Labor	$3,203	BOR	WRR	Tracy Office
Labor	$10,000	BOR		Denver Technical Service
Implementation - Equipment Maintenance				
Labor	$5,043	BOR	WRR	Tracy Office
Labor	$5,853	BOR	WRR	Tracy Office
Implementation - Eqipment Maintenance				
	$0			
Planning and Analysis - Research Proposals and Study Packets				
	$0			
Labor	$17,617	BOR	WRR	Tracy Office
Reporting - Publication - Tracy Technical Series and Fisheries Journal submittals				
Labor	$26,054	BOR	WRR	Tracy Office
Labor	$17,617	BOR	WRR	Tracy Office
Research - Applied Research - Predation				
Labor	$20,000	BOR	WRR	Denver Technical Services
	$0			
Labor	$14,215	BOR	WRR	Tracy Office
Research - Applied Research - Facility Efficiency				
Labor	$27,360	BOR	WRR	Denver Technical Service
Labor	$22,996	BOR	WRR	Tracy Office
Labor	$2,970	BOR	WRR	Denver Technical Service
Research - Applied Research - FacilityEfficiency				
Labor	$57,655	BOR	WRR	Tracy Office
Research - Applied Research - Fish Handling				
Labor	$7,200	BOR	WRR	Denver Technical Service
Labor	$7,207	BOR	WRR	Tracy Office
Labor	$31,776	BOR	WRR	Tracy Office
Labor	$990	BOR	WRR	Denver Technical Service

b1 San Joaquin River Sturgeon Habitat Assessment

San Joaquin River Sturgeon Habitat Assessment

Classification:	Reconnaissance, Reconnaissance
Location:	, San Joaquin Lower Mainstem
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	13 - Combined charter covering all habitat assessment, adult tagging/tracking and juvenile monitoring sturgeon work. This work is providing baseline data for several proposed and potential future AFRP projects. No funding request beyond FY16
Partners:	CDFW
Related Programs:	CDFW

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	This project is specifically designed to assess the presence and habitat preferences of sturgeon in the San Joaquin Basin. The next step in these efforts is identifying, designing and implementing restoration projects.

Metrics

Name	Value	Units	Comment
Habitat Assessment	1	number of reports	
Population Assessment	1	number of reports	

Deliverables

Date	Title
Jul. 2016	2015 Annual monitoring report
Jul. 2017	2016 Annual monitoring report

Narrative

This effort provides information on the habitat use of spawning fish, response to environmental cues, and in conjunction with telemetry data, may help determine if White Sturgeon in the San Joaquin River are a population independent of the one that occurs in the Sacramento River and if habitat protection and restoration within the San Joaquin River are needed to increase the abundance of this important species.

Research to date has demonstrated that White Sturgeon spawn in the San Joaquin River in some years (Gruber et al. 2012; Jackson and Van Eenennaam 2013) but not others (Faukner and Jackson 2014). Even relatively healthy White Sturgeon populations often experience recruitment failure (Parsley and Beckman 1994; Schaffter and Kohlhorst 1999) and suitable rearing habitat for larval and juvenile life history phases may be the limiting factor for White Sturgeon production (Coutant 2004). An early attempt at collecting larval sturgeon on the San Joaquin River (Miller 1972) and a recent effort (Faukner and Jackson 2014) failed to collect any specimens. The spring of 2013 was dry and discharge in the mainstem of the San Joaquin River was low, resulting in poor spawning conditions for sturgeon. Therefore it is not surprising that sampling efforts in the mainstem of the San Joaquin River failed to collect either White Sturgeon eggs or larvae (Faukner and Jackson 2014) during 2013. However, it remains unknown if larval White Sturgeon production occurs during years with favorable environmental conditions. Future sampling for larval sturgeon may clarify if early life history survival is a factor limiting White Sturgeon production in the San Joaquin River and what, if any, management actions need to be taken to increase White Sturgeon abundance.

Data Management

Data sheets, receiver files, and annual reports are stored at the Lodi Fish and Wildlife Office. Data is entered into Excel workbooks and an effort is being undertaken to develop an Access database for long-term storage. Receiver files are uploaded to the Hydra database currently in use by the California Fish Tracking Consortium. Annual reports are available on the Lodi Fish and Wildlife Office website.

Risks

Risk	Likelihood	Impact
Hiring Freeze	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$168,284	$0	$168,284

Total Cost: $168,284

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Acquisition - Replace sampling gear and supplies; vessel and equipment maintenance and repair; tissue analyses.				
Equipment or Materials	$6,100	FWS	CVPRF	Sampling devices, anchors, floats, line, and hardware; temperature loggers; water and tissue storage supplies, water and tissue analyses; vessel

Type	**Total**	**Agency**	**Fund**	**Description**
				and equipment maintenance and repair.
Monitoring - Spawning surveys and physical habitat data collection				
Labor	$92,276	FWS	CVPRF	GS-5 Bio Sci Techs (2)
Labor	$69,908	FWS	CVPRF	GS-9 Fish Bio

b1 Buttonbush Floodplain Restoration Project

Restore functional seasonally inundated floodplain and side channel habitat at the USACE Buttonbush Recreation Area to increase juvenile rearing habitat.

Classification: Improvement, Habitat Restoration

Location: , Stanislaus River

Funding Years: 2012 - 2017

Benefits Start Year: 2015

Priority: 6 - This is a high priority implementation project, scheduled to break ground summer 2015

Partners: USACE, Cramer Fish Sciences

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
b1: Contribute towards Priority Actions	1	number of improvements	Contributes to FRP Stanislaus River A2. Will provide 3.3-11.5 acres of restored habitat and 6,000 to 32,000 cy of spawning gravel depending on the alternative selected.

Deliverables

Date	Title
Dec. 2017	Project Completion Report
May. 2013	Three Design Alternatives
Jun. 2015	Final Design
Jun. 2015	Environmental Compliance Permits

Narrative

Salmonid populations Stanislaus River appears to be limited by juvenile rearing habitat. The cause of the limitation is construction of large dams flat-lining the hydrograph, and blocking coarse sediment recruitment. Options for increasing juvenile rearing habitat include modifying both instream and adjacent riparian areas to improve seasonal inundation of shallow water habitats.

This project aims to restore functional seasonally inundated floodplain and side channel habitat at the USACE Buttonbush Recreation Area to increase juvenile rearing habitat through excavating perched floodplains and augmenting instream habitat with excavated gravel that has been screened to appropriate size.

The project implements Stanislaus River Action 2 [Improve watershed management to restore and protect instream and riparian habitat, including consideration of restoring and replenishing spawning gravel.] of the Final Restoration Plan.

The grant has been awarded to Cramer Fish Sciences and is working with the landowner USACE.

The project is not funded through (b)(13) because it is fundamentally a habitat improvement action [(b)(1)], does not have a non-federal match, and could not be accomplished with existing (b)(13) funding.

Data Management

Data will be stored on the Lodi FWO Server.

Risks

Risk	Likelihood	Impact
Landowner backs out	1	3
Project not undertaken	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2015	CVPRF	$990,551	$0	$990,551

Total Cost: $990,551

Activities and Resources

Type	Total	Agency	Fund	Description
2015				
Construction - Build the Project as designed.				
Agreement	$795,000	FWS	CVPRF	

Type	Total	Agency	Fund	Description
Management - Management of the project				
Agreement	$24,980	FWS	CVPRF	
Monitoring - Post-project monitoring. *As-built surveys.* *Other physical and biological surveys as developed by the project monitoring plan.* *Permit required monitoring.*				
Agreement	$129,496	FWS	CVPRF	
Outreach - Pre-project outreach to neighbors and stakeholders.				
Agreement	$26,341	FWS	CVPRF	
Reporting - Final Project Report.				
Agreement	$14,734	FWS	CVPRF	

b1 Knights Ferry Floodplain Restoration Project

Restore functional seasonally inundated floodplain and side channel habitat at the USACE Knights Ferry Recreation Area to increase juvenile rearing habitat.

Classification:	Improvement, Habitat Restoration
Location:	Knights Ferry Recreation Area, Stanislaus River
Funding Years:	2013 - 2017
Benefits Start Year:	2015
Priority:	6 - Large-scale floodplain restoration project on the Stanislaus River that will improve rearing and survival of juvenile salmonids.
Partners:	USACE, Cramer Fish Sciences
Related Programs:	NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	This project aims to restore functional seasonally inundated floodplain and side channel habitat to increase juvenile rearing habitat through excavating perched floodplains and augmenting instream juvenile rearing and adult spawning habitat with excavated gravel that has been screened to appropriate size. This project meets Action 2 of the Final Restoration Plan and is similar to recently completed and ongoing AFRP projects on the Stanislaus River that address habitat restoration of multiple habitat types for multiple life-history stages of salmonids.

Metrics

Name	Value	Units	Comment
b1: Contribute towards Priority Actions	1	number of improvements	The project addresses FRP Stanislaus River A2. Expected benefits are up to 2 acres of habitat restored. Spawning gravel amounts are dependent on designs which are not yet complete.
Spawning/Floodplain Habitat	2	acres	

Deliverables

Date	Title
Dec. 2018	Project Completion Report

Date	Title
Feb. 2015	Three Conceptual Design Alternatives
Jun. 2015	Environmental Compliance Permits
Jun. 2015	Final Project Design

Narrative

Salmonid populations Stanislaus River appears to be limited by juvenile rearing habitat. The cause of the limitation is construction of large dams flat-lining the hydrograph, and blocking coarse sediment recruitment. Options for increasing juvenile rearing habitat include modifying both instream and adjacent riparian areas to improve seasonal inundation of shallow water habitats.

This project aims to restore functional seasonally inundated floodplain and side channel habitat at the USACE Knights Ferry Recreation Area to increase juvenile rearing habitat through excavating perched floodplains and augmenting instream habitat with excavated gravel that has been screened to appropriate size.

The project implements Stanislaus River Action 2 [Improve watershed management to restore and protect instream and riparian habitat, including consideration of restoring and replenishing spawning gravel.] of the Final Restoration Plan.

The grant has been awarded to Cramer Fish Sciences and is working with the landowner USACE.

The project also offers a great opportunity to showcase restoration to the local community and multiple school field trips.

The project is not funded through (b)(13) because it is fundamentally a habitat improvement action [(b)(1)], does not have a non-federal match, and could not be accomplished with existing (b)(13) funding.

Data Management

Data will be stored on the Lodi FWO Server.

Risks

Risk	Likelihood	Impact
Landowner willingness to allow project to be built near historic features. FWS and USACE are currently in discussions to finalize design and ensure project is acceptable for both entities	1	3

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$283,634	$0	$283,634

Total Cost: $283,634

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Construction - Build the Project as designed.				
Agreement	$48,500	FWS	CVPRF	
Management - Project management				
Agreement	$10,600	FWS	CVPRF	
Monitoring - Post-project monitoring *As-built surveys* *Other physical and biological surveys as developed by the project monitoring plan* *Permit required monitoring*				
Agreement	$127,200	FWS	CVPRF	
Outreach - Pre-project outreach to neighbors and stakeholders				
Agreement	$10,600	FWS	CVPRF	
Reporting - Final Project Report				
Agreement	$86,733	FWS	CVPRF	

b1 Migratory Corridor Rehabilitation

Restore shallow water migratory habitat for juvenile salmonids in the Stanislaus River downstream of Riverbank.

Classification:	Improvement, Habitat Restoration
Location:	, Stanislaus River
Funding Years:	2014 - 2020
Benefits Start Year:	2016
Priority:	21 - AFRP would work in close coordination with the (b)(13) provision and other partners working further upstream in the Stanislaus River to expand high quality migratory habitat downstream of Riverbank and protect and enhance the natural production of salmonids in the system.
Partners:	No Data.
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	The actual design and implementation approach of these potential projects is yet to be determined and significant research and assessment into the condition of existing habitats, sites available to complete projects and specific needs of juvenile salmonids in these areas needs to be determined as part of the initial phase of this project. As projects are identified and designed, some specific sites may be most most appropriately funded under the (b)(1) or (b)(13) provision in the future.

Metrics

Name	Value	Units	Comment
b1(other): Area of hab prot and rest (acres)	0	miles	placeholder until designs are complete
b1(other): Area of hab prot and rest (acres)	0	acres	placeholder until designs are complete

Deliverables

Date	Title
Sep. 2016	Preliminary conceptual designs
Jun. 2017	Final Design
Jun. 2017	Permits

Date	Title
Dec. 2021	Final Report

Narrative

Restore shallow water migratory habitat for juvenile salmonids on the Stanislaus River downstream of Riverbank. Potential sites have been identified, and landowners will be contacted to determine interest prior to submission of an RFP or RFQ.

Data Management

Data will be housed on the Lodi FWO server.

Risks

Risk	Likelihood	Impact
landowner support/access	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2017	CVPRF	$975,200	$0	$975,200
2016	CVPRF	$381,600	$0	$381,600
2018	CVPRF	$286,200	$0	$286,200

Total Cost: $1,643,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Design - Three conceptual designs				
Agreement	$106,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to design juvenile salmonid habitat improvements at priority sites with willing landowners in the lower Stanislaus River (downstream of Riverbank).
Environmental Compliance and Permitting - Acquire all necessary permits				
Agreement	$106,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to complete necessary environmental compliance and permitting

Type	Total	Agency	Fund	Description
				documents related to juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Inventory/Reconnaissance - Pre-project topographic and biological surveys.				
Agreement	$106,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to complete pre-project surveys related to juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Management - Manage the project				
Agreement	$10,600	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to identify willing landowners at priority sites, design and implement juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Outreach - Inform and solicit input from local residents and additional stakeholders.				
Agreement	$53,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to perform local outreach and education related to juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
2017				
Construction - Build the project.				
Agreement	$795,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to implement juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Management - Manage the project				
Agreement	$21,200	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to identify willing landowners at priority sites, design and implement juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Monitoring - Post-project assessments including: as-built surveys, flow measurement, vegetation measurement, biological surveys for salmonids and salmonid food species.				
Agreement	$106,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to monitor and assess effectiveness of recently implemented juvenile salmonid habitat improvements in the lower

Type	Total	Agency	Fund	Description
				Stanislaus River (downstream of Riverbank).
Outreach - Inform and solicit input from local residents and additional stakeholders.				
Agreement	$53,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to perform local outreach and education related to juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
2018				
Management - Manage the project				
Agreement	$47,700	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to identify willing landowners at priority sites, design and implement juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Monitoring - Post-project assessments including: as-built surveys, flow measurement, vegetation measurement, biological surveys for salmonids and salmonid food species.				
Agreement	$212,000	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to monitor and assess effectiveness of recently implemented juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).
Reporting - Final project completion report including post-project assessment.				
Agreement	$26,500	FWS	CVPRF	A grant or cooperative agreement will be completed with a qualified entity to produce final reports related to juvenile salmonid habitat improvements in the lower Stanislaus River (downstream of Riverbank).

b1 Sturgeon Barrier Evaluation

Evaluation of potential Stanislaus River Sturgeon Barrier

Classification: Research, Fish Passage

Location: , Stanislaus River

Funding Years: 2015 - 2016

Benefits Start Year: 2016

Priority: 14 - High priority potential sturgeon barrier on the Stanislaus River.

Partners: No Data.

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Barrier Assessment	1	number of reports	Will provide baseline information for further analysis of barrier passability.

Deliverables

Date	Title
Dec. 2016	Final Report

Narrative

USFWS staff will evaluate a location around RM 2 on the lower Stanislaus that Zac Jackson thinks may be a sturgeon barrier. Data on depths and velocities will be collected at the site at three flows spanning as wide a range of flows as possible. Depth and velocity data will be collected using a combination of an Acoustic Doppler Current Profiler (ADCP) and a survey-grade RTK GPS unit. For each traverse with the ADCP, the RTK GPS will be used to record the horizontal location at the starting and ending location of each traverse, while the ADCP provides depths, velocities and distances across the traverse. The horizontal location at the starting and ending location of each ADCP traverse will then be used together with the depths and velocities from the ACDP to map depths and velocities throughout the site, similar to the following figures. The mapped depths and velocities will be used to assess whether this site is a barrier to upstream sturgeon passage at the three flows for which data is collected.

Data Management

Data will be housed on the Lodi FWO server.

Risks

Risk	Likelihood	Impact
Site access during limited flow (can likely be alleviated by waiting for scheduled flow releases)	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$3,477	$0	$3,477

Total Cost: $3,477

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Research - Study the problem				
Labor	$3,477	FWS	CVPRF	Half of the costs (Mark Gard) are included in AFRP Administrative Charter - $3,660, 0.01284 FTE. The other half of costs are for Rick Williams (small craft operator).

Stanislaus River rotary screw trap monitoring

Quantify production of juvenile Chinook salmon and the abundance of juvenile steelhead in the Stanislaus River (Caswell State Park) using rotary screw traps.

Classification: Performance Monitoring, Performance Monitoring

Location: , Stanislaus River

Funding Years: 2015 - 2016

Benefits Start Year: 2015

Priority: 1 - Monitoring of juvenile salmon production on the Stanislaus River provides fundamental data that are necessary to assess the biological response to habitat restoration activities in a CVP watershed. The project is also CAMP-recommended monitoring activity in the CAMP Implementation Plan (element #78), and it is a required element in the OCAP biological opinion. The project is also important because it provides the longest time series of rotary screw trap data in the San Joaquin River Basin. Charter is to be funded using the FY 2016 CAMP President's budget allocation.

Partners: No Data.

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Comprehensive Assessment and Monitoring Program

Metrics

Name	Value	Units	Comment
count of fish produced	0	number of fish	The production or abundance of different life stages of juvenile salmon and steelhead are calculated on an annual basis using monitoring data that are collected with rotary screw traps.

Deliverables

Date	Title
Dec. 2016	annual Stanislaus River - Caswell State Park rotary screw trap report

Narrative

The rotary screw trap monitoring activities in the Stanislaus River provide data that can be used to assess the biological response to habitat management activities in that watershed. As such, they can be used to infer, at a watershed-level scale, how habitat restoration activities are

affecting the number of juvenile Chinook salmon and steelhead in that river. The annual reports associated with the rotary screw trap operations on the Stanislaus River are currently available on the CAMP website at: http://www.fws.gov/sacramento/Fisheries/CAMP-Program/Documents-Reports/fisheries_camp-program_documents-reports.htm

Data Management

The Stanislaus River rotary screw trap data will be stored in the CAMP Rotary Screw Trap Platform. Data summaries from the Platform can be provided to CVPIA managers, stakeholders and the public.

Risks

Risk	Likelihood	Impact
low, unless funding distribution is delayed	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$197,000	$0	$197,000
2017	CVPRF	$201,913	$0	$201,913

Total Cost: $398,913

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Agreement	$197,000	FWS	CVPRF	Project cost includes the 6% contract overhead cost.
2017				
Monitoring -				
Agreement	$201,913	FWS	CVPRF	The 2017 project cost uses the 2016 cost estimate (and therefore includes the 6% contract overhead cost), and includes a 3% inflation cost.

Stanislaus River Salmonid Spawning and Rearing Habitat Restoration

Implements annual spawning and rearing habitat restoration project on the Stanislaus River - Current locations are at Goodwin Rec area (gravel augmentation) and Two Mile Bar (side channel creation, floodplain enhancement and gravel augmentation).

Classification: Improvement, Habitat Restoration

Location: , Stanislaus River

Funding Years: 2014 - 2017

Benefits Start Year: 2015

Priority: 1 -

Partners: CDFW, USACE, Oakdale Irrigation District, South San Joaquin Irrigation District, Mangante Livestock

Related Programs: NMFS-RPAs

Authority

Provision	Percentage	Comment
(b)(13) Gravel	100.0%	

Metrics

Name	Value	Units	Comment
b13: Stanislaus R: percentage of spawning salmonids using placed gravel	25	percentage of fish	
b13: Stanislaus R; Spawning gravel placed annually (tons)	3000	tons	Also, RPA action for steelhead

Deliverables

Date	Title
Sep. 2016	2016 Project Implemented
Sep. 2015	2015 Project Implemented
Sep. 2017	2017 Project Implemented

Narrative

The project implements spawning and rearing habitat improvement projects in the Stanislaus River. Current project locations are in Goodwin Canyon at the Goodwin Dam Recreation Area access and at Two mile Bar (two miles downstream of Goodwin Dam). The top priority action is the creation of side channel habitat, enhanced floodplain habitat, and gravel augmentation at Two Mile Bar. The site is on private land where we have been working out the technical details with MP-400 realty specialist for a few years for an agreement with the landowner. Work would occur here if an agreement can be put in place. The fallback will be gravel augmentation and

existing sites in Goodwin Canyon. Draft designs have been completed for Two Mile Bar for interagency review.

The Goodwin Canyon work overlaps with a similar charter submitted under b1 for a larger long-term gravel gravel addition project.

This project includes all the permitting, design, implementation, and associated effectiveness monitoring. If the Two Mile Bar is permitted then additional funding will be needed to fully implement a project at that site.

Data Management

Data maintained by USBR and USFWS project managers and will be disseminated in annual reports. Contacts: John Hannon at USBR Bay-Delta Office; Julie Zimmerman at USFWS Bay-Delta Office.

Risks

Risk	Likelihood	Impact
Landowner agreements not worked out	2	2
Permitting not worked out with Corps parks office.	2	2
State cost share not worked out.	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2015	CVPRF	$300,000	$300,000	$0
2016	CVPRF	$300,000	$300,000	$0
2017	CVPRF	$330,000	$330,000	$0

Total Cost: $930,000

Activities and Resources

Type	Total	Agency	Fund	Description
2015				
Implementation - Permit, design, implement, and monitor project effectiveness.				
Labor	$300,000	BOR	CVPRF	Cost covers gravel augmentation at existing sites in Goodwin Canyon accessed through the Goodwin Recreation area. Additional funding will be sought if Two Mile Bar is able to be implemented in 2015. Goodwin gravel project overlaps with a b1 charter

Type	Total	Agency	Fund	Description
				for expanded gravel augmentation at Goodwin Rec
2016				
Implementation - Permit, design, implement, and monitor project effectiveness.				
Agreement	$300,000	BOR	CVPRF	Cost covers gravel augmentation at existing sites in Goodwin Canyon accessed through the Goodwin Recreation area. Additional funding will be sought if Two Mile Bar is able to be implemented in 2016. Goodwin gravel project overlaps with a b1 charter for expanded gravel augmentation at Goodwin Rec.
2017				
Implementation - Permit, design, implement, and monitor project effectiveness.				
Agreement	$330,000	BOR	CVPRF	Cost covers gravel augmentation at existing sites in Goodwin Canyon accessed through the Goodwin Recreation area. Additional funding will be sought if Two Mile Bar is able to be implemented in 2017.

b1 Tuolumne River - River Mile 44 Spawning and Rearing Habitat Restoration

Tuolumne River - River Mile 44 Spawning and Rearing Habitat Restoration. Project will consist of floodplain grading, floodplain reconnection, gravel processing and in-channel gravel injection using processed floodplain material.

Classification:	Improvement, Habitat Restoration
Location:	, Tuolumne River
Funding Years:	2015 - 2020
Benefits Start Year:	2016
Priority:	18 - This project follows the successful Bobcat Flat restoration project immediately downstream and with the same project partners. The previous project has shown significant use by adult and juvenile salmonids during spawning and rearing periods and provides highly productive floodplain habitat for juvenile salmonids, which is an extremely important limiting factor for Tuolumne River natural production.
Partners:	Tuolumne River Conservancy
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	Habitat restoration

Metrics

Name	Value	Units	Comment
Stream Channel restored (miles)	1	miles	Placeholder; awaiting designs
Riparian Corridor Improvements	1	miles	Placeholder; awaiting designs

Deliverables

Date	Title
Jun. 2017	Environmental Documents and permits
Jun. 2017	Project Designs
Sep. 2018	Construction Summary Report
Sep. 2020	Annual Report

Narrative

Funding is requested to develop engineering plans and acquire necessary permits. Future funding will be requested to excavate an elevated floodplain to allow it to become inundated at river flows of 1,000 to 2,500 cfs. Excavated cobble will be screened on site to produce

approximately 40,000 yds3 of coarse sediment mix of ¼ to 4 inch material to be placed in the river channel. The project will enhance floodplain and river connectivity, provide off-channel rearing habitat, promote sustainable riparian plant communities, and restore in-stream salmonid spawning and rearing habitat. Estimated increases in habitat resulting from this project include 3 acres of floodplain and four acres of in-stream spawning and rearing habitat.

Data Management

Data will be archived at Lodi FWO.

Risks

Risk	Likelihood	Impact
Environmental compliance related to riparian vegetation removal/restoration (same process that was permitted at Bobcat Flat will be proposed here)	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2017	CVPRF	$626,163	$0	$626,163
2018	CVPRF	$243,800	$0	$243,800
2016	CVPRF	$213,590	$0	$213,590
2019	CVPRF	$3,180	$0	$3,180

Total Cost: $1,086,733

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Design -				
Agreement	$137,800	FWS	CVPRF	Design concepts will be discussed among agreement recipient and CDFW partners in Region 4. Designs will be reviewed at various pre-arranged check-in points and will precede permit application submission.
Environmental Compliance and Permitting -				
Agreement	$62,010	FWS	CVPRF	Permits will be obtained once designs are sufficiently advanced.
Management -				
Agreement	$13,780	FWS	CVPRF	Agreement Management and Deliverables

Type	Total	Agency	Fund	Description
2017				
Construction -				
Agreement	$602,080	FWS	CVPRF	First year construction activities including floodplain grading and gravel excavation, sorting, and in-stream installation.
Management -				
Agreement	$24,083	FWS	CVPRF	Agreement Management
2018				
Construction -				
Agreement	$212,000	FWS	CVPRF	Second and final year construction activities, barring unforeseen permitting delays or unfavorable environmental conditions.
Management -				
Agreement	$31,800	FWS	CVPRF	Agreement Management
2019				
Management -				
Agreement	$3,180	FWS	CVPRF	Agreement Management

b1 Tuolumne River: Dos Rios Floodplain Restoration

Floodplain and Riparian Restoration at River Partners' Dos Rios property.

Classification:	Improvement, Off-Channel
Location:	, Tuolumne River
Funding Years:	2016 - 2017
Benefits Start Year:	2017
Priority:	16 - Program Priority Comments:Project site is at the confluence of the Tuolumne and San Joaquin rivers and provides potential benefits to existing AFRP priority watersheds as well as migrating salmonids from the SJRRP area; project also includes cost share >50%.
Partners:	NRCS, CDWR, River Partners
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Restored floodplain	15	acres	Total project acreage: 159 acres Acreage of earthwork: 15 acres Swales and benches, 5 acres bunny mounds

Deliverables

Date	Title
Jul. 2017	Annual construction report
Mar. 2018	Annual monitoring report
Mar. 2019	Annual monitoring report

Narrative

The project footprint includes 159 acres of farm land at the confluence of the Tuolumne and San Joaquin rivers. The project preliminary design involves 20 total acres where earthwork will occur; 15 acres of swales and floodplain benches would be excavated and designed to inundate under flood conditions and a portion would inundate under lower flow regimes for juvenile salmonid rearing and migratory habitat; 5 acres of higher ground would be created out of excavated materials in order to provide flood refugia for (ESA listed) riparian brush rabbits.

NRCS and CDWR are contributing $421,000 for planning, permitting, management, re-vegetation and monitoring.

Data Management

Construction and monitoring data will be summarized in annual reports and archived at Lodi FWO.

Risks

Risk	Likelihood	Impact
Flood conditions (site can become saturated at relatively high SJR flows)	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS	Local
2016	CVPRF	$447,320	$0	$447,320	$0
2016		$421,000	$0	$0	$421,000
2017	CVPRF	$26,500	$0	$26,500	$0

Total Cost: $894,820

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Construction - Excavation of perched floodplains to create swales and floodplain benches; excess materials will be formed into mounds to serve as flood refugia for riparian brush rabbits.				
Agreement	$420,820	FWS	CVPRF	Construction activities associated with floodplain excavation.
Implementation - Planning, Permitting, Project Management, Monitoring and Site Revegetation				
Direct Contribution	$421,000	Local		NRCS and CDWR are contributing $421,000 for planning, permitting, management, re-vegetation and monitoring.
Outreach - Community outreach including community work days to engage local folks in the restoration, Trekking the Tuolumne program outings for elementary school students, and the local SLEWS program.				
Agreement	$26,500	FWS	CVPRF	Funding for community outreach including community work days to engage local folks in

Type	Total	Agency	Fund	Description
				the restoration, Trekking the Tuolumne program outings for elementary school students, and the local SLEWS program.
2017				
Outreach - Community outreach including community work days to engage local folks in the restoration, Trekking the Tuolumne program outings for elementary school students, and the local SLEWS program.				
Agreement	$26,500	FWS	CVPRF	Funding for community outreach including community work days to engage local folks in the restoration, Trekking the Tuolumne program outings for elementary school students, and the local SLEWS program.

b1 Impacts of Marijuana Activity on Fish

Impacts of Marijuana Activity on Fish

Classification:	Reconnaissance, Reconnaissance
Location:	, Upper Sacramento and Tributaries
Funding Years:	2013 - 2018
Benefits Start Year:	2018
Priority:	8 - Very high priority as an issue CV wide. Identified as an issue in the NMFS Recovery plan. Can impact multiple watersheds. This project, along with similar efforts in the Coastal Range of California have lead to a much better understanding of the scope and impact of marijuana cultivation on fish and aquatic resources. It is expected that AFRP will use the results to develop restoration projects in heavily impacted tributaries and that this initial effort will be of great value to the larger fish and aquatic habitat management and restoration community.
Partners:	CDFW, SWRCB
Related Programs:	CALFED, NMFS-RP, EWP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Threat Assessment	1	number of reports	Assessment project of the risks imposed by marijuana growing on anadromous fish populations

Deliverables

Date	Title
Sep. 2018	GIS Map and Data of marijuana distribution
Oct. 2015	Monitoring Committee Info
Jul. 2016	QAPP and Monitoring Plan
Sep. 2018	Final Report
Jul. 2015	Bibliography on marijuana Impacts

Narrative

The purpose of this multi-year study is to determine the potential impacts, and/or the degree of impact, to northern California aquatic resources, specifically listed anadromous fish, posed by

marijuana cultivation activities. This information can also be used to develop a plan to reduce and/or remove the negative effect of marijuana cultivation on natural resources and/or to allow law enforcement to be more effective in prosecuting civil and criminal cases.

This project is comprised of multiple phases, in part due to funding limitations, but also due to the need to most effectively develop a robust and defendible study plan to address the multi-faceted issue created by the problem of legal and illegal marijuana cultivation. The objectives of the first phase include developing a study plan; developing a multi agency team to provide input on the study design and also to facilitate coordination amongst agencies involved with the problem; creating and maintaining information on the study area and the extent of marijuana growing on the landscape; identifying and prioritizing area(s) of study. Future phases include field data collection, analysis and interpretation. Once the threats are defined, including those threats relative to other land use practices, the next step is to provide law enforcement personnel with the tools needed to better qualify and quantify the level of impact from growing marijuana in watershed with anadromy. Protocols will be developed to use in this step, for the benefit of land use managers. Additional goals are to better understand the effect of marijuana growing on anadromous fish at a range and/or population scale; identify and prioritize areas to protect or restore; and to develop a process by which this impact can be managed over a longer term.

Although this evaluation and pilot project is not directly called out in the AFRP Final Restoration Plan, it has become an extremely important topic and area of concern in the last several years. This funding is designed to invetigate the problem and develop a protocol and potential immediate solutions to limit the impacts to fish and aquatic habitats when these detrimental sites are found. The results of these efforts will provide a highly valuable process for partners throughout the Central Valley to deal with this emerging issue. Partners on the existing project include several programs within CDFW.

Data Management

Information developed by this project will be housed in the Red Bluff FWO office, the Red Bluff Fisheries office of CDFW, and the GIS section of CDFW Region 1 in Redding, as appropriate. GIS products may also be shared with the State Water Resources Control Board.

Risks

Risk	Likelihood	Impact
Landowner access permission	1	1
Exposure to hazardous materials and/or conditions	2	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$116,388	$0	$116,388
2017	CVPRF	$86,051	$0	$86,051

Total Cost: $202,439

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - Monitoring in future phases				
Agreement	$116,388	FWS	CVPRF	Continue ongoing agreement to refine monitoring and reporting protocols.
2017				
Monitoring - Monitoring in future phases				
Agreement	$86,051	FWS	CVPRF	Continue ongoing agreement to refine monitoring and reporting protocols. Final Report.

b1 Juvenile Salmonid Acoustic Tagging

Juvenile Salmonid Acoustic Tagging

Classification:	Reconnaissance, Reconnaissance
Location:	, Upper Sacramento and Tributaries
Funding Years:	2012 - 2017
Benefits Start Year:	2012
Priority:	9 - High priority, ongoing agreement that has implications for many CVPIA provisions and partners.
Partners:	Pacific States Marine Fisheries Commission, CDFW, NMFS
Related Programs:	Interagency Ecological Program, NMFS-RP, CALFED

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	This project has been funded previously under the (b)(1) authority as it has potential to inform future habitat restoration projects. However, it also provides significant and valuable data related to juvenile salmonid survival and distribution and therefore, is appropriate under the (b)(16) provision

Metrics

Name	Value	Units	Comment
Juvenile fish tagged	0	number of fish	Actual Unit will be number of juvenile fish tagged and results of tag monitoring. Exact value is unknown at this time.
Population Assessment	1	number of reports	

Deliverables

Date	Title
Sep. 2017	Final Report Survival and migratory patterns of wild juvenile spring- and fall-run Chinook salmon
Sep. 2017	Final Report Survival and migratory patterns of wild juvenile winter-run Chinook salmon

Narrative

Recent advances in acoustic telemetry technology have resulted in acoustic transmitters which are small enough to be implanted in previously untaggable critical life stages of juvenile o.mykiss and Chinook salmon from the fall, winter, and spring races. This technology will be

used to release acoustically-tagged o.mykiss and fall, spring, and winter-run Chinook salmon smolts over a period of five years. The juvenile salmonids may be captured and released in Deer, Mill, Antelope, Battle, and Clear Creeks and/or the Sacramento River. This tagging effort will enable the National Marine Fisheries Service (NMFS) to evaluate the effect of natural and anthropogenic changes in flow and related water project operations on juvenile salmonid survival and movement patterns within the Sacramento River and Delta. This information will provide resource managers in California with a more comprehensive understanding of the response of juvenile salmon outmigration under a wide variety of flow conditions and Delta water management practices from which to make water management decisions.

FY15 funds would be the third year of funding for this project. Based on updates and interim reports received to date (April 2015), a fourth and fifth year of funding is in order. A summary report is expected later in 2015.

Hypotheses:

1) Fall, spring, and winter-run Chinook salmon juveniles will experience significant mortality during downstream migration from source location through the Delta to the entrance to San Francisco Bay and the mortality rates are likely to be higher than previously observed for larger late-fall Chinook salmon and steelhead (O. mykiss).

2) Mortality rates will vary between the groups as a function of fish size, environmental conditions, and source location.

Altough this specific evaluation is not called out in the AFRP Final Restoration Plan, it takes advantage of a larger ongoing ERP/NMFS study evaluating the use of the relatively new JSAT tagging technology for juvenile salmonids.

Project partners include ERP (which has funded the larger tagging effort and receiver array that is being used for this project) and NMFS (which is conducting the tagging and assisting with receiver downloads/maintenance).

Based on the results of this initial study, specific b(1) projects to benefit anadromous fish may be developed. Additionally, the long-term need for this monitoring and the appropriate CVPIA authority or other potential funding entities will be explored.

Data Management

The data for this project will be stored at the Red Bluff Fish and Wildlife Office as well as the NOAA/MFS Santa Cruz National Marine Fisheries Office co-located at UCSC.

Risks

Risk	Likelihood	Impact
no juvenile fish emigrate in any one year	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$174,270	$0	$174,270
2017	CVPRF	$174,270	$0	$174,270

Total Cost: $348,541

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Research - Release acoustically-tagged wild fall, spring, and winter-run Chinook salmon smolts over a period of four years to evaluate the effect of natural and anthropogenic changes in flow and related water project operations on their survival and movement patterns within the Sacramento River and Delta.				
Agreement	$174,270	FWS	CVPRF	Ongoing Interagency Agreement bewtween FWS and National Marine Fisheries Service. Limited collection of juveniles during first three years leads to the need to increase the sample size to increase statistical validity.
2017				
Research - Release acoustically-tagged wild fall, spring, and winter-run Chinook salmon smolts over a period of four years to evaluate the effect of natural and anthropogenic changes in flow and related water project operations on their survival and movement patterns within the Sacramento River and Delta.				
Agreement	$174,270	FWS	CVPRF	Continued Interagency Agreement. Acoustic tagging of juvenile salmonids to answer life history questions.

b1 Yuba River Daguerre Alley Floodplain Restoration Project

Yuba River Daguerre Alley Floodplain Restoration Project

Classification:	Improvement, Side-Channel
Location:	, Yuba River
Funding Years:	2013 - 2018
Benefits Start Year:	2014
Priority:	2 - Program Priority Comments:High priority, large-scale restoration project that will benefit naturally produced juvenile salmonids in the Yuba River.
Partners:	cbec, inc., PG&E, South Yuba River Citizens League, Cramer Fish Sciences, Teichert Aggregates, Yuba River Management Team
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	Habitat Restoration

Metrics

Name	Value	Units	Comment
b1: # Fall-run Chinook	1	miles	Miles of Habitat Restored.
b1: # Fall-run Chinook	1	miles	Miles of Riparian Habitat Enhanced.
Floodplain grading/restoration	40	acres	

Deliverables

Date	Title
Dec. 2016	Annual Report

Narrative

"Daguerre Alley" is a large (2.5-mile long x 0.1 mile wide) remnant Yuba River channel located downstream of Daguerre Point Dam, on lands which are part of the Teichert Hallwood Facility gravel operation. Fish habitat enhancement will be achieved through increased frequency of surface water connectivity between the main Yuba River channel and the existing small, intermittent channel and extensive floodplain of Daguerre Alley. Also, improved habitat features will be constructed and floodplain revegetation will be implemented to provide high quality, off-channel rearing habitat for juvenile Chinook salmon and steelhead which currently is very limited in the lower Yuba River. Initial site visits and baseline mapping and modeling were conducted by the Yuba River Management Team. A small ($25,000) FY2012 grant from PG&E to cbec funded initial meetings with the landowner, hydrologic modeling, and habitat restoration

concept designs. Funding from AFRP ($150K in FY2013 and $150K in FY2014) is being used to complete an alternatives analysis and initial project design, continue discussions with the landowner, conduct pre-project fish and habitat monitoring (before-after-control-impact (BACI) design), and complete permitting. Implementation is expected to begin in FY2015. cbec is the AFRP grantee, but Cramer Fish Sciences and SYRCL will assist with fish monitoring and riparian planting, respectively.

Due to the size of the site, the project has the potential to be quite large, depending on funding; up to 150 acres of floodplain habitat and approximately 2.5 miles of side channel habitat could be restored. Work in FY2015 is expected to include extensive grading/floodplain lowering and riparian planting of approximately 40-50 acres of floodplain habitat, and modifying and extending the existing side channel by approximately 0.3 miles. We are requesting implementation funding of $1.6M for FY2015. Cost estimates are based on experience with habitat restoration in the lower American River, and riparian planting completed at Hammon Bar in the lower Yuba River (SYRCL 2013). The landowner is Teichert Aggregates, and the Teichert Hallwood Plant manager has enthusiastically provided access to the property for riparian and fish monitoring by various agencies and groups. Teichert does not have permits to mine in Daguerre Alley itself, but has expressed interest in participating in the project so as to gain access to the substrate removed from floodplain grading. Teichert's participation likely would reduce the cost of the project, but there is some uncertainty due to the need to coordinate with their anticipated mining activities. Fall- and spring-run Chinook salmon and steelhead will benefit from this project. The project directly addresses AFRP Final Restoration Plan/CPAR non-structural action E4, Evaluate the benefits of restoring stream channel and riparian habitats of the Yuba River, including the creation of side channels for spawning and rearing habitats for salmonids. The Yuba River was identified as a CVPIA priority stream in the USFWS Fish Focus Group (FFG) process circa 2008, although it was not designated as a watershed priority in the Final Restoration Plan. Similarly, juvenile rearing habitat in the Yuba River was not identified as a primary or secondary limiting factor in the Final Restoration Plan, but was identified as the primary limiting factor by the FFG.

Reference:

South Yuba River Citizens League. 2013. Hammon Bar Riparian Enhancement Project Report. Prepared for the U.S. Fish and Wildlife Service, Anadromous Fish Restoration Program. Nevada City, CA. 26 pages.

Data Management

All reports and monitoring data files including pre-and post- project monitoring which includes but not limited to topographic surveys, biological and physical environmental data, HEC-RAS model, ArcView GIS shapefiles and coverages, geodatabase, Computer Aided Design (CAD) drawing files, and all supporting information used for project design and permitting will be saved

on computers located at the cbec, inc. office in West Sacramento and backed up on an offsite server. Electronic copies will be provided to USFWS-AFRP.

Risks

Risk	Likelihood	Impact
Additional coordination with the landowner regarding their mining schedule, etc. is required.	2	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$237,440	$0	$237,440
2017	CVPRF	$213,060	$0	$213,060
2018	CVPRF	$213,060	$0	$213,060

Total Cost: $663,560

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Construction - 40-50 acres of floodplain grading and riparian planting, 0.3 miles of side-channel restoration.				
Agreement	$1,060	FWS	CVPRF	Work may extend into out years depending on the landowner's mining schedule.
Monitoring - Pre- and post-project fish and habitat monitoring.				
Equipment or Materials	$24,380	FWS	CVPRF	Temperature sensors, transmitters, mounts etc. to monitor habitat temperatures specifically for bioenergetic modelling of juvenile salmonids to document project effectiveness.
Agreement	$212,000	FWS	CVPRF	Monitoring will extend into out years and may include measurements of physical habitat parameters, invertebrate and fish abundance, and cage studies to examine fish growth.
2017				
Construction - 40-50 acres of floodplain grading and riparian planting, 0.3 miles of side-channel restoration.				
Agreement	$1,060	FWS	CVPRF	Work may extend into out years depending on the landowner's mining schedule.

Type	Total	Agency	Fund	Description
Monitoring - Pre- and post-project fish and habitat monitoring.				
Agreement	$212,000	FWS	CVPRF	Monitoring will extend into out years and may include measurements of physical habitat parameters, invertebrate and fish abundance, and cage studies to examine fish growth.
2018				
Construction - 40-50 acres of floodplain grading and riparian planting, 0.3 miles of side-channel restoration.				
Agreement	$1,060	FWS	CVPRF	Work may extend into out years depending on the landowner's mining schedule.
Monitoring - Pre- and post-project fish and habitat monitoring.				
Agreement	$212,000	FWS	CVPRF	Monitoring will extend into out years and may include measurements of physical habitat parameters, invertebrate and fish abundance, and cage studies to examine fish growth.

b1 Yuba River Hammon Bar Velocity Validation

Yuba River Hammon Bar Velocity Validation

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Yuba River
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	15 - Additional validation of recently completed pilot restoration project on the Yuba River.
Partners:	South Yuba River Citizens League
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Habitat Assessment	1	miles	
Habitat Assessment	1	number of reports	

Deliverables

Date	Title
Dec. 2016	Annual Report

Narrative

AFRP funded a riparian restoration pilot project (5 acres) on Hammon Bar in the lower Yuba River that was successfully implemented in 2011 and 2012. The purpose of this work is to assess the accuracy of the velocities simulated by the River2D model of the post second year plantings, created in FY-14. This will allow more accurate assessment of the value of the site as juvenile rearing habitat when it inundates. Timing of the work will be determined in response to the occurrence of high flows (greater than 2,000 cfs) required for inundation. Mean column velocities will be measured at two flows that inundate the Hammon Bar plantings with a wading rod and a Marsh-McBirneyR model 2000 velocity meter. Depth will be recorded to the nearest 0.1 foot and average water column velocity will be recorded to the nearest 0.01 ft/s. The horizontal location of each velocity measurement will be recorded with a survey-grade RTK GPS unit. Measurements will be made downstream of both pod and stinger plantings, with at least 100 measurements made for each type of planting at each of the two flows. The River2D model of the post second year plantings, created in FY-14, will be run at the two flows, and the

measured velocities will be compared to the velocities simulated by River2D at the horizontal locations recorded with the survey-grade RTK GPS unit. Cost estimate from FWS Staff is $13,000 for FY2016. If the site does not inundate, the work will be delayed until FY2017.

Data Management

Depth and velocity measurements will be entered into a laptop computer. The horizontal location of each velocity measurement will be recorded with a survey-grade RTK GPS unit. The existing River2D model model for the study site will be run at the two flows, and the measured velocities will be compared to the velocities simulated by River2D at the horizontal locations recorded with the survey-grade RTK GPS unit. All reports and monitoring data files will be saved on local FWS computers and backed up on a server. Electronic copies will be provided to USFWS-AFRP.

Risks

Risk	Likelihood	Impact
This project has a high likelihood of successful implementation (low overall risk) because it is post-project monitoring, and available FWS staff routinely performs this kind of work.	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$6,953	$0	$6,953

Total Cost: $6,953

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring - Post-project monitoring of the AFRP-funded riparian restoration project on Hammon Bar.				
Labor	$6,953	FWS	CVPRF	Collection of actual velocity data during inundation events, and comparison with velocities predicted from an existing model. Cost for Mark Gard is included in AFRP Administrative Charter ($6,100, 0.0214 FTE). This cost is for John Henderson (Bay-Delta Office staff).

b1 Yuba River Juvenile Salmonid Rearing Habitat Restoration

Yuba River Juvenile Salmonid Rearing Habitat Restoration. Juvenile floodplain habitat restoration.

Classification:	Improvement, FloodPlain
Location:	, Yuba River
Funding Years:	2016 - 2021
Benefits Start Year:	2017
Priority:	20 - Project will identify and build out at least one juvenile floodplain habitat on the Yuba River. This habitat type is widely recognized as severely lacking in this watershed. Additional partners and funding sources will be engaged once potential sites are identified
Partners:	South Yuba River Citizens League, Western Aggregates, cbec, inc., Yuba County Water Agency
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	

Metrics

Name	Value	Units	Comment
Habitat Restored	1	miles	

Deliverables

Date	Title
Sep. 2016	All Permits
Aug. 2016	Final Designs

Narrative

High quality juvenile salmonid rearing habitat is lacking on the lower Yuba River. This project would create or improve rearing habitat primarily through side-channel, floodplain, or riparian restoration, or the installation of instream woody material. Specific sites and actions will be selected based on concepts presented in two habitat restoration planning documents for the lower Yuba River that were developed as deliverables for a recent AFRP award. One document (cbec, inc. eco engineering et al. 2010) identifies potential restoration sites and features for the 4-mile reach from Parks Bar to Hammon Bar, and the second (cbec, inc. 2013) addresses similar actions at selected sites for the 17-mile reach from Parks Bar to the City of Marysville, with particular emphasis on alternative flow scenarios that may be implemented under the new FERC license

expected for the Yuba River Development Project in 2016. Partnerships already have been developed with key landowners (e.g., Western Aggregates, U.S. Bureau of Reclamation, etc.). As specific project sites and designs are developed and ongoing efforts to develop collaborative funding sources within the Yuba River mature, it is expected that many potential options for financial support from non-federal partners will arise and be pursued.

Cost estimate for FY2015 is $150,000 to select a specific project or projects, and complete designs and permits. Implementation funding for FY2016 and out years could range from $300K to $1.6M, depending on the size and number of projects chosen. Cost estimates are based on experience with habitat restoration in the lower American River. As an additional reference, the Appendix L of the Final Habitat Expansion Plan (CDWR and PG&E 2010) estimates the cost of implementing a suite of the projects identified in cbec inc. eco engineering et al. (2010) as $1.3M. Fall- and spring-run Chinook salmon and steelhead will benefit from this project. The Yuba River was identified as a CVPIA priority stream in the USFWS Fish Focus Group (FFG) process circa 2008, although it was not designated as a watershed priority in the Final Restoration Plan. The project addresses AFRP Final Restoration Plan/CPAR non-structural action E4, Evaluate the benefits of restoring stream channel and riparian habitats of the Yuba River, including the creation of side channels for spawning and rearing habitats for salmonids. Juvenile rearing in the Yuba River was not identified as a primary or secondary limiting factor in the Final Restoration Plan, but was identified as the primary limiting factor by the FFG.

References:

California Department of Water Resources and Pacific Gas and Electric Company. 2010. Habitat Expansion Agreement for Central Valley spring-run Chinook salmon and California Central Valley steelhead – Final Habitat Expansion Plan. November 2010. ICF J&S 00854.08. Sacramento, CA. November 2010.

cbec, inc. eco engineering, South Yuba River Citizens League, and McBain & Trush, Inc. 2010. Rehabilitation concepts for the Parks Bar to Hammon Bar reach of the lower Yuba River. November 2010. cbec Project # 08-1021. 67 pages.

cbec, inc. 2013. Hydrologic and geomorphic analysis to support rehabilitation planning for the lower Yuba River from Parks Bar to Marysville. Final Report prepared for South Yuba River Citizens League and the U.S. Fish and Wildlife Service. December 6, 2013. cbec Project #: 13-1003. 93 pages.

Data Management

All reports and monitoring data files will be saved on grantee/contractor local computers and backed up on a server. Electronic copies will be provided to USFWS-AFRP.

Risks

Risk	Likelihood	Impact
This project has a high likelihood of successful implementation (overall low risk) because substantial planning (hydrologic modeling and concept level designs) and establishment of landowner relationships have already occurred, and AFRP has funded and completed a pilot riparian restoration project in the lower Yuba River.	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$159,000	$0	$159,000
2017	CVPRF	$1,696,000	$0	$1,696,000
2018	CVPRF	$106,000	$0	$106,000

Total Cost: $1,961,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Design - Final design(s) for one or more projects.				
Agreement	$26,500	FWS	CVPRF	Hydrologic modeling and concept designs have been completed. This would fund final designs.
Environmental Compliance and Permitting - Permit(s) for one or more projects.				
Agreement	$132,500	FWS	CVPRF	AFRP may assist with permitting if multiple sites are identified
2017				
Implementation - Implementation of one or more projects (side-channel, floodplain, or riparian restoration, or the installation of instream woody material).				
Agreement	$1,696,000	FWS	CVPRF	Implementation funding could be split over multiple years and could be up to $1.6M. If design and permitting are funded in FY16, other partners will be engaged in efforts to find

Type	Total	Agency	Fund	Description
				additional non-CVPIA funding.
2018				
Implementation - Implementation of one or more projects (side-channel, floodplain, or riparian restoration, or the installation of instream woody material).				
Agreement	$106,000	FWS	CVPRF	If projects are funded for implementation and completed in FY17, additional projects may be developed for future implementation by CVPIA and partners.

b1 Yuba River Narrows Restoration Project

Yuba River Narrows Restoration Project

Classification:	Improvement, Spawning Gravel
Location:	, Yuba River
Funding Years:	2012 - 2017
Benefits Start Year:	2014
Priority:	3 - Priority restoration of spawning and rearing habitat immediately downstream of Englebright Dam.
Partners:	UC-Davis, USACE, Cramer Fish Sciences, Yuba River Management Team, ESA
Related Programs:	NMFS-RP

Authority

Provision	Percentage	Comment
(b)(1) AFRP	100.0%	Restoration of high value spawning and rearing habitat which will contribute to doubling goal targets.

Metrics

Name	Value	Units	Comment
b1: # Fall-run Chinook	1	miles	Miles of Habitat Restored.

Deliverables

Date	Title
Dec. 2016	Annual Report

Narrative

The 2-mile reach of the lower Yuba River just downstream of Englebright Dam (the Englebright Dam/Narrows reach) comprises a canyon, and the substrate primarily is bedrock; consequently it is very different from the rest of the lower Yuba River, much of which has extensive gravel substrate due to legacy gold mining. Extensive mapping and hydrologic modeling of the reach has occurred both as part of this award and by the Yuba River Management Team and USACE (e.g., Brown and Pasternack 2014; both Brown (ESA/UC-Davis) and Pasternack (UC-Davis) are involved in this project). Also, a draft habitat restoration planning document for the Englebright Dam/Narrows reach already has been developed as part of this award, and will be finalized in FY2014, as will designs and permits for an initial project. ESA is the grantee, but Cramer Fish Sciences has been assisting with fisheries analyses and monitoring, and Greg Pasternack of UC-Davis has an advisory role. The project has the potential to be quite large, depending on funding, although all 2 miles cannot be accessed by heavy equipment. As indicated by the planning

document analysis, habitat restoration will primarily target restoration of spawning habitat for spring-run Chinook salmon, and likely involve some combination of gravel augmentation and channel contouring, gravel stockpiling (for free distribution at high flows), and the removal of "shotrock," a remnant of dam construction. In the past, spring-run Chinook salmon have been observed attempting to spawn on the bedrock, and small gravel augmentation efforts by USACE (about 4000 cubic yards in 2010-11, 2012, and 2013) have quickly attracted spawners.

Cost estimate for implementation in FY2015 is $1M, with an additional $1M in FY2016 depending on the size and actions selected. Cost estimates are based on experience with habitat restoration in the lower American River, but transportation costs (e.g., for gravel or shotrock) are expected to be high for this project due to the canyon location. As an additional reference, the Final Habitat Expansion Plan for Central Valley spring-run Chinook salmon and California Central Valley steelhead (CDWR and PG&E 2010) estimates the cost of removing the majority of the shotrock from a key location (Sinoro Bar) in the Englebright Dam/Narrows Reach at approximately $5.9M and a second project primarily involving gravel augmentation and grading at $1.8M. For our project, shotrock will be removed on a trial basis. Spring-run Chinook salmon and steelhead will benefit from this project. The Yuba River was identified as a CVPIA priority stream in the USFWS Fish Focus Group (FFG) process circa 2008, although it was not designated as a watershed priority in the Final Restoration Plan. The project addresses AFRP Final Restoration Plan/CPAR non-structural action E4, Evaluate the benefits of restoring stream channel and riparian habitats of the Yuba River, including the creation of side channels for spawning and rearing habitats for salmonids. Spawning habitat in the Yuba River was not identified as a primary or secondary limiting factor in the Final Restoration Plan, but was identified as the secondary limiting factor by the FFG.

References

Brown, R.A., and G.B. Pasternack. 2014. Hydrologic and topographic variability modulate channel change in mountain rivers. Journal of Hydrology 510:551-564.

California Department of Water Resources and Pacific Gas and Electric Company. 2010. Habitat Expansion Agreement for Central Valley spring-run Chinook salmon and California Central Valley steelhead – Final Habitat Expansion Plan. November 2010. ICF J&S 00854.08. Sacramento, CA. November 2010.

Data Management

All reports and monitoring data files including pre-and post- project monitoring which includes but not limited to topographic surveys, biological and physical environmental data, HEC-RAS model, ArcView GIS shapefiles and coverages, geodatabase, Computer Aided Design (CAD) drawing files, and all supporting information used for project design and permitting will be saved

on local ESA computers, and backed up on a server. Electronic copies of data files and electronic and hard copies of reports will be provided to USFWS-AFRP.

Risks

Risk	Likelihood	Impact
Landowner access is not 100% assured for this intensive project but has been provided in the past for fish habitat restoration and monitoring projects.	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$1,070,600	$0	$1,070,600
2017	CVPRF	$2,120	$0	$2,120

Total Cost: $1,072,720

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Construction - Gravel augmentation, channel grading, gravel stockpiling, and shotrock removal.				
Agreement	$996,400	FWS	CVPRF	Transportation costs are likely to be high due to canyon location.
Monitoring - Pre- and post-construction fish and habitat monitoring. Includes as-built surveys by FWS Instream Flow Branch in FY2016 and FY2017.				
Agreement	$74,200	FWS	CVPRF	Substrate mapping, redd surveys, etc. Includes as-built surveys by FWS Instream Flow Branch (costs for that portion are already covered in AFRP administrative charter).
2017				
Construction - Gravel augmentation, channel grading, gravel stockpiling, and shotrock removal.				
Agreement	$1,060	FWS	CVPRF	Additional construction may occur in FY2017 with remaining funds.
Monitoring - Pre- and post-construction fish and habitat monitoring. Includes as-built surveys by FWS Instream Flow Branch in FY2016 and FY2017.				
Agreement	$1,060	FWS	CVPRF	Additional monitoring is likely to occur in 2017

Type	Total	Agency	Fund	Description
				with remaining funds.

CVP watershed adult salmon escapement database

Develop a database containing the complete range of biological data for adult Chinook salmon that were collected during escapement surveys on the four Central Valley Project watersheds since 1992

Classification:	Performance Monitoring, Performance Monitoring
Location:	, Central Valley Project Improvement Act
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	1 - Development of a database storing adult salmon escapement data for the four CVP watersheds will substantially improve the access to complete and standardized data sets that can quickly be incorporated into decision support models pertaining to the Central Valley Project Improvement Act. Charter is to be funded using the FY 2016 CAMP President's budget allocation.
Partners:	CDFW, Pacific States Marine Fisheries Commission
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(16) CAMP	100.0%	Comprehensive Assessment and Monitoring Program

Metrics

Name	Value	Units	Comment
develop a database	1	number of fish	A single database storing adult salmon escapement data would facilitate the ability to quickly and easily develop data summaries that could be used in a variety of analyses.

Deliverables

Date	Title
Sep. 2016	database with adult salmon data for the four CVP watersheds

Narrative

Central Valley Project Improvement Act program managers and staff are currently involved in multiple efforts that require timely access to adult Chinook salmon data. Unfortunately, a single database providing access to the complete range of biological data pertaining to adult salmon collected during carcass escapement surveys on the four CVP watersheds since 1992 does not

exist. Those four watersheds are the American River, Clear Creek, Sacramento River, and Stanislaus River.

The CAMP is proposing to develop a partnership with state and federal biologists that have conducted adult salmon escapement surveys, with the goal of consolidating the adult salmon data that have been collected in the four CVP watersheds so it can be provided in a standardized fashion in a single database that is easily queried. Examples of the types of data that would be included in the database include location, demographic age, gender, and coded wire tag-related data.

The draft CVPIA Implementation Plan calls for the development of decision support models and performance metrics that will involve various biological parameters, and the development of the proposed database would serve as a cornerstone in providing data that would be used in those efforts. Similarly, the database would provide data that could quickly and easily be used in the ongoing "Big Data" project that is being conducted to evaluate factors that substantially affect the efficacy of habitat restoration activities.

Data Management

In collaboration with state and federal fishery agencies, a single database would be constructed with fields that are used to store the complete range of biological data that have been collected during adult salmon carcass escapement surveys in four CVP streams since 1992. After the database structure has been finalized, biological data from the watersheds would be migrated or entered into the database.

Risks

Risk	Likelihood	Impact
Delays in fund acquisition could delay the project start and completion	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$168,679	$0	$168,679

Total Cost: $168,679

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Monitoring -				
Agreement	$168,679	FWS	CVPRF	Total project cost is $168,670. Of that amount, $159,122 would be available for a cooperative agreement after a 6% contract overhead charge is paid.

b12 Clear Creek McConnell Foundation

The BOR-McConnell Foundation water exchange contract provides substitute water to the McConnell Foundation. The water transfer costs for the substitute water are borne by the b12 Clear Creek Restoration program

Classification:	Administration, Administration
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	3 - This action is not included in the 2016 Priorities Document.This action is a priority due to the legal binding requirements of the water exchange contract.
Partners:	No Data.
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	

Metrics

Name	Value	Units	Comment
N/A	0	N/A	

Deliverables

No Data.

Narrative

Bureau of Reclamation and the McConnell Foundation entered into a water exchange contract on August 11, 2000. The contract provides for Reclamation to provide substitute water (up to 5,100 acre-feet, annually) to the Foundation. This contract was part of a larger settlement by Reclamation, Townsend Flat Water Ditch Company, The McConnell Foundation, Centerville Community Services District, and the California Department of Fish and Game (now CA. Dept. of Fish and Wildlife), which allowed for the removal of Saeltzer Dam from Clear Creek, and the modification of Townsends water right to divert water from Clear Creek.

The removal of Saeltzer Dam and the water exchange contract made Reclamation responsible for providing substitute water to the Foundation.

The CVPIA (b)(12) Clear Creek Restoration Program pays for the costs associated with this substitute contract, on a per acre-feet basis. The default value of the costs projected by the b12 program is $5,000 per year. Actual costs may vary annually, with no costs incurred in some years.

This is a legal contract, and as such there are no benefits and no deliverables.

Data Management

The Annual Work Plan information developed by this Charter will be housed at Reclamations Northern California Area Office (Shasta Dam, CA) and the U.S. Fish and Wildlife Services Red Bluff Fish and Wildlife Office (Red Bluff, CA).

The actual acre-feet volumes of water exchanged under the conditions of the contract, the cost of the exchange, and associated data/information is housed at the Bureaus Mid-Pacific Regional Office MP-3600 Division of Financial Management.

Risks

Risk	Likelihood	Impact
Unexpected change in water demand	2	3
Lower water demand	1	1
higher water demand	1	3
Average water demand	3	1
Funding reductions	2	3

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	WRR	$10,000	$10,000	$0

Total Cost: $10,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Acquisition - Water transfer costs for the current year.				
Agreement	$10,000	BOR	WRR	Estimated water transfer cost of $10,000

b12 Replace Oak Bottom Temperature Control Curtain

Improve water temperatures in Clear Creek, Trinity and Sacramento R. with new curtain in Whiskeytown

Classification:	Improvement, Other Habitat Restoration
Location:	, Clear Creek
Funding Years:	2015 - 2016
Benefits Start Year:	2015
Priority:	3 - Important for 3 high priority watersheds with 4 listed stocks. In 2016 Priority Document Table 4. Ongoing Actions. Record ID 1946. OCAP RPA BO action. Replace the Spring Creek Temperature Control Curtain.
Partners:	NMFS, SWRCB, CDFW, CDWR
Related Programs:	No Data.

Authority

Provision	Percentage	Comment
(b)(12) Clear Creek Flows	100.0%	

Metrics

Name	Value	Units	Comment
SWRCB Water Temperature Target	56	degrees	For winter Chinook spawning and incubation in the Sacramento River
CVPIA / RPA Water Temperature Target	56	degrees	For spring Chinook spawning and incubation in Clear Creek
CVPIA / RPA Water Temperature Target	60	degrees	For spring Chinook holding in Clear Creek
SWRCB Water Temperature Target	56	degrees	For salmon spawning and incubation in the Trinity River

Deliverables

Date	Title
Sep. 2018	Evaluation of New Oak Bottom Temperature Control Curtain

Narrative

Whiskeytown Lake receives cold water from the Trinity River basin, through the Francis Carr Tunnel. The Oak Bottom Curtain (OBC) was designed to minimize the mixing of the colder water Trinity River water with the warmer surface water of Whiskeytown Lake thereby maintaining a supply of cold water for the Sacramento River to protect salmonids, especially winter-run Chinook Salmon. The cold water also benefits Clear Creek anadromous fish

restoration. In addition, because the water is colder, less of it is needed to achieve temperature control in both the Sacramento River and Clear Creek. This can increase the amount of water available for Trinity River fish.

The OBC was in serious disrepair and no longer effective in serving its intended purpose. National Park Service staff have been concerned about the OBT as a safety hazard. It was removed from Whiskeytown in 2015 and a replacement is scheduled for construction in the fall of 2015. The removal and replacement is being funded outside of the Restoration Fund. The new curtain should be evaluated to insure it is operating correctly and to it's best ability. Previous evaluations have improved operation of temperature control curtains, potentially reducing the amount of water required for temperature control and increasing compliance with temperature control criteria. It is assumed that the funding source replacing the curtain will provide funding for the evaluations.

Data Management

Information for the charter including relevant protocols for understanding the information, will be permanently housed at Northern California Area Office of Reclamation.

Risks

Risk	Likelihood	Impact
Replacement will not work	1	2

Cost Estimate

Year	Fund	Total	BOR	FWS
2018	WRR	$20,000	$20,000	$0

Total Cost: $20,000

Activities and Resources

Type	Total	Agency	Fund	Description
2018				
Monitoring - Evaluate new temperature control curtain to optimize its performance and insure that it is working as intended.				
Labor	$20,000	BOR	WRR	Could this be done in-house?

Instream Water Acquisition

Purchase of water for instream purposes

Classification: Improvement, Instream Flows

Location: , Central Valley Wide

Funding Years: 2015 - 2018

Benefits Start Year: 2015

Priority: 2 - Program Priority Comments:

Partners: FWS

Related Programs: No Data.

Authority

Provision	Percentage	Comment
(b)(3) Instream Flows	100.0%	

Metrics

Name	Value	Units	Comment
b3: Instream Flow;Suppl b2 water (acre-feet)	200000	acre-feet	

Deliverables

Date	Title
Oct. 2015	Negotiate and execute contracts for water purchases

Narrative

The objective of the Instream Water Acquisition Program is to acquire water to supplement the 800,000 acre-feet of dedicated CVP yield for fisheries. The target for instream acquisitions is approximately 200,000 acre-feet per year, for use on the San Joaquin and Sacramento Rivers and their tributaries as described in the CVPIA PEIS/ROD.

Data Management

Data for the Instream Water Acquisition Program is maintained in the Resources Division, MP410.

Risks

Risk	Likelihood	Impact
Adequate water may not be available for purchase	1	1

Cost Estimate

Year	Fund	Total	BOR	FWS
2016	CVPRF	$500,000	$500,000	$0
2017	CVPRF	$500,000	$500,000	$0
2018	CVPRF	$500,000	$500,000	$0

Total Cost: $1,500,000

Activities and Resources

Type	Total	Agency	Fund	Description
2016				
Acquisition - Acquire water to supplement the quantity of water dedicated under (b)(2) for fish, wildlife and habitat restoration purposes. Acquisitions will focus on flows to support the Central Valley wide fish doubling goal.				
Agreement	$500,000	BOR	CVPRF	Acquire water to supplement the quantity of water dedicated under (b)(2) for fish, wildlife and habitat restoration purposes. Acquisitions will focus on flows to support the Central Valley wide fish doubling goal.
2017				
Acquisition - Acquire water to supplement the quantity of water dedicated under (b)(2) for fish, wildlife and habitat restoration purposes. Acquisitions will focus on flows to support the Central Valley wide fish doubling goal.				
Agreement	$500,000	BOR	CVPRF	Acquire water to supplement the quantity of water dedicated under (b)(2) for fish, wildlife and habitat restoration purposes. Acquisitions will focus on flows to support the Central Valley wide fish doubling goal.
2018				
Acquisition - Acquire water to supplement the quantity of water dedicated under (b)(2) for fish, wildlife and habitat restoration purposes. Acquisitions will focus on flows to support the Central Valley wide fish doubling goal.				
Agreement	$500,000	BOR	CVPRF	Acquire water to supplement the quantity of water dedicated under (b)(2) for fish, wildlife and habitat restoration purposes. Acquisitions will focus on flows to support the Central Valley wide fish doubling goal.