Revised
Framework for Implementation

July 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Table of Contents

Tables

Figures

Appendices

List of Abbreviations and Acronyms

2012 Framework	Third Party Working Draft Framework for Implementation, dated June 19, 2012
CEQA	California Environmental Quality Act
cfs	cubic feet per second
Conservation Facility	Salmon Conservation and Research Facility
CVP	Central Valley Project
DFW	California Department of Fish and Wildlife
DWR	California Department of Water Resources
EIS/R	Environmental Impact Statement/Report
ESA	Endangered Species Act
FY	Fiscal Year
Flood Control Project	Lower San Joaquin Flood Control Project
MAP	Monitoring and Analysis Plan
m^2	square meters
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOD	Notice of Determination
PEIS/R	Program Environmental Impact Statement/Report
O&M	Operations and maintenance
Program	San Joaquin River Restoration Program
Reclamation	U.S. Bureau of Reclamation
Revised Framework	Revised Framework for Implementation
ROD	Record of Decision
RWA	Recovered Water Account
USFWS	U.S. Fish and Wildlife Service
SCCAO	South-Central California Area Office
Settlement	Stipulation of Settlement in *Natural Resources Defense Council, et al., v. Kirk Rodgers, et al.,*
Settlement Act	San Joaquin River Restoration Settlement Act
SJRR Fund	San Joaquin River Restoration Fund
SJRRP	San Joaquin River Restoration Program
SMP	Steelhead Monitoring Plan
SWRCB	State Water Resources Control Board

Executive Summary

This document is an update and revision to the *Third Party Working Draft Framework for Implementation*, dated June 19, 2012 (2012 Framework), and establishes a realistic schedule for the implementation of the San Joaquin River Restoration Program (SJRRP or Program) based upon the best available technical, biological, schedule, and funding information. Specifically, this Revised Framework establishes the following:

- Five year visions to provide clear, realistic, and accomplishable steps towards meeting the Restoration Goal and Water Management Goal in the Stipulation of Settlement in *NRDC, et al. v. Kirk Rodgers, et al.* (Settlement) and the San Joaquin River Restoration Settlement Act, Title X, Subtitle A, Part I of Public Law 111-11 (Settlement Act) and towards completing the "Friant Division Improvements" in Title X, Subtitle A, Part III of Public Law 111-11;

- Achievable schedules based upon realistic Federal and State of California appropriation levels, improving our ability to plan and be transparent on actions; and,

- More clearly defined roles and responsibilities for each Implementing Agency, increasing each agency's ability to budget, plan, and approve construction actions.

This Revised Framework provides a more realistic schedule and associated future funding needs for the SJRRP Implementing Agencies to focus on implementation of the Settlement, Settlement Act and Friant Division Improvements. This Revised Framework is primarily focused on activities necessary to plan, permit, design, and construct major physical project elements of the SJRRP. Table ES-1 details the actions scheduled for completion during each five year vision in this Revised Framework. Table ES-2 details the anticipated costs for the SJRRP actions.

This Revised Framework is a "living" document and additional updates will be made as additional information is gained and milestones are reached. In addition, this Revised Framework represents a path forward in compliance with the Settlement and Settlement Act, but may not encompass all of the actions that may ultimately be taken to implement the SJRRP. The ultimate implementation of the SJRRP will be shaped by decisions made through planning processes that are part of the SJRRP, such as the Fisheries Management Plan, environmental processes, permit requirements, and adaptive management.

Table ES-1. Schedule of Key Construction Actions

2015-2019	2020-2024	2025-2029	2030+
Goal: At least 1,300 cfs Capacity in all Reaches	Goal: Increased Capacity	Goal: Phase 1 Projects Complete	Goal: All Remaining Projects
• Friant-Kern Capacity Restoration • Madera Canal Capacity Restoration • Mendota Pool Bypass • Temporary Arroyo Canal Screen and Sack Dam Passage • Conservation Facility • Seepage Projects to at least 1,300 cfs	• Financial Assistance for Groundwater Banks • Reach 2B • Arroyo Canal and Sack Dam • Reach 4B Land Acquisition • Seepage Projects to 2,500 cfs • Levee Stability to 2,500 cfs	• Reach 4B • Salt and Mud Sloughs • Chowchilla Bifurcation Structure Modifications • Highest Priority Gravel Pits • Seepage Projects to 4,500 cfs • Levee Stability to 4,500 cfs	• Ongoing Operations and Maintenance

Note: cfs = cubic feet per second

1. The Revised Framework is primarily focused on activities necessary to plan, permit, design and construct major physical project elements of the SJRRP.

Table ES-2. SJRRP Project and Activity Estimated Costs (in millions)

	2012 Framework (Various $ Years)	2015 Revised (2015 $)
Staffing and Administration	$78	$124[1]
Flow Actions		
Conservation Strategy / Mitigation Measures	$35	$38
Flows	$45	$26[2]
Channel and Structural Improvements		
Mendota Pool Bypass and Reach 2B	$312	$336[3]
Reach 4B, Eastside Bypass and Mariposa Bypass	$156	$274[4]
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$25	$31
Salt and Mud Slough Seasonal Barriers	$14	$6
Passage at Key Barriers	Part of 4B	$6
Fish Establishment		
All Other Fish Establishment Actions	$27	$12
Conservation Facility	$21	$26
Water Management Goal & Friant Division Improvements	$100	$96
Total	**$813**	**$974**
Seepage Projects	$79	$189[5]
Chowchilla Fish Passage	N/A	$20
Gravel Pits Filling or Isolation	N/A	$14
Miscellaneous	N/A	$49
Total Settlement & Friant Division Improvements	**$892**	**$1,244**
Levee Stability	$189	$307[6]
Total	**$1,081**	**$1,551**

Notes:
1 Additional costs include addition of California Department of Fish and Wildlife (DFW) staff costs and reflection of 5 additional years shown on schedule.
2 Does not anticipate costs for related to Unexpected Seepage Losses and reduced monitoring.
3 Excludes Mendota Pool Fish Screen costs as fish entrainment would be an infrequent occurrence. Updated land acquisition costs and operation and maintenance costs, indexed cost estimates to April 2015.
4 Average cost of all Reach 4B alternatives. Framework only considered Eastside Bypass. Updated land acquisition and operations and maintenance costs and added Eastside Bypass setback levees, indexed cost estimates to April 2015.
5 Updated land acquisition costs and included operation and maintenance costs.
6 Updated based on hydraulic modeling and slurry wall costs, included staff time. Levee stability costs are likely to decrease.

Accomplishments and Remaining Actions

The original schedule for implementation envisioned in the Settlement was ambitious by design and reflected the Parties' intent to complete the improvements in an expeditious manner. Many assumptions were made in developing the schedule, and while the Parties' have exercised due diligence, some actions are unavoidably behind schedule. That said, many of the planning and management actions that establish the foundation of the SJRRP have been accomplished. This includes the following:

- Release of Interim Flows. This included developing and implementing a flow monitoring program and a process to avoid seepage impacts on adjacent agricultural lands (see Seepage Management Plan and Seepage Project Handbook).
- Completion of the SJRRP's Program Environmental Impact Statement/Report (PEIS/R), Record of Decision (ROD), and Notice of Determination (NOD). These documents provide program-level National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance for all actions in the Settlement and some actions in the Settlement Act along with project-level NEPA compliance for the release of Interim and Restoration flows.
- Completion of modifications to the Bureau of Reclamation's (Reclamation's) water rights permits at Friant Dam to implement the release of Interim and Restoration flows provided in the Settlement on a long-term basis.
- Completion of the rules and permits necessary to implement the SJRRP's spring-run broodstock and direct release efforts.
- Completion of the Restoration Flow Guidelines and beginning of Restoration Flows.
- Completion of modifications to the Friant Division long-term contracts consistent with the Settlement Act.
- Completion of an Environmental Impact Report and NOD for construction and operation of the Salmon Conservation and Research Facility (Conservation Facility), release of Chinook salmon to the Restoration Area, and fisheries monitoring and research actions.

Vision Approach

This Revised Framework prioritizes SJRRP actions to ensure efficient use of resources and expeditious construction of actions. In order to accomplish this, projects and activities have been prioritized into five year increments, with a focused "vision" for each five year increment. Each vision: (1) limits and focuses actions to what can realistically be achieved within the five year span, based upon the best information currently available; and, (2) is formulated to make incremental and measurable progress in achieving the goals of the Settlement.

All of the channel and structural improvement projects identified in Paragraph 11(a) and 11(b) of the Settlement are included. However, the more realistic funding outlay and updated prioritization necessitates dividing some of the larger actions into smaller components with a delayed implementation schedule across several five year visions. While the Agencies will

continue with the environmental compliance as one large project, the design and construction may be broken into smaller and more manageable increments. The delayed implementation of some of these projects may require temporary actions that were not originally identified in the 2012 Framework, but are critical to addressing SJRRP needs while the long-term solutions are phased into completion.

Estimated costs are identified for each year; however, it is recognized that activities and actual costs will vary from year to year; therefore, the emphasis is to complete all activities within each five year vision at the overall cost. This provides the year to year flexibility necessary for a program of the size, magnitude, and complexity of the SJRRP to adjust as some actions take longer or shorter than originally planned. As additional funding becomes available beyond the amount needed in each five year vision, activities from the next five year vision will be prioritized to the extent practical.

Five Year Vision (Fiscal Year 2015-2019)

The main focus of the Five Year Vision is to provide additional channel capacity in the San Joaquin River and complete two of the Friant Division Improvement projects (Friant-Kern Canal and Madera Canal Capacity Restoration).

Ten Year Vision (Fiscal Year 2020-2024)

The main focus of the Ten Year Vision is to build out Reach 2B, implement the Arroyo Canal and Sack Dam project, and award all remaining financial assistance for local groundwater banking projects to reduce or avoid the impacts of the Restoration Flows. Channel capacity will be increased to approximately 2,500 cubic feet per second (cfs) throughout all reaches via seepage and levee stability projects. Planning, environmental compliance, and design for the Salt and Mud Slough barriers will be completed. All project decisions will be made, such as the determination of highest priority gravel pits, and whether modifications to the Chowchilla Bypass Control Structure are needed.

Fifteen Year Vision (Fiscal Year 2025-2029)

The main focus of the Fifteen Year Vision is to complete the remaining Phase 1 and Phase 2 channel and structural improvement projects in Paragraph 11(a) and 11(b) of the Settlement and achieve full Restoration Flows.

Beyond Fifteen Year Vision (Fiscal Year 2030+)

The main focus of the Beyond Fifteen Year Vision is to complete all remaining construction actions, monitor and maintain the system, achieve a naturally reproducing, self-sustaining population of spring-run and fall-run Chinook salmon, and maximize achievement of the SJRRP.

Cost Considerations

A summary of the estimated costs to implement the SJRRP from FY 2015 to FY 2029, in FY 2015 dollars, is provided in Table ES-2. Implementing Agency costs provided in this Revised Framework are based upon the best available information; however, most cost estimates are based on conceptual or preliminary designs and thus a significant amount of uncertainty exists in the estimates. It is expected that some costs may increase, such as those for the Arroyo Canal

Fish Screen and Sack Dam Fish Passage Project, while some costs may decrease, such as those for the levee stability projects. Cost estimates provided in this update are not intended to be final and are not intended for funding or decision making purposes[1]. The cost estimates in this update are provided for planning purposes and provide a general sense of the magnitude of actions.

Cost estimates are only provided for the Five, Ten, and Fifteen Year Visions, as costs beyond the Fifteen Year Vision are too speculative. For the Beyond Fifteen Year Vision, a description of the activities currently anticipated is provided, but no speculation on costs. Cost estimates for the Beyond Fifteen Year Vision will be added into subsequent updates of the Framework.

This Revised Framework includes cost estimates for actions that are likely not the financial responsibility of the SJRRP. Specifically, responsibility for levee stability costs is currently unknown. In some reaches, the historical operation and maintenance (O&M) of the channel and levees may have not been completed to the level required in the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project (The Reclamation Board 1967). Although all reaches of the river, except Reach 2B and Reach 4B1, were designed to carry flows sufficient to pass the SJRRP's Restoration Flows when the Lower San Joaquin Flood Control Project (Flood Control Project) was constructed, the current conveyance capacity of these reaches appears to be much less. At this time, it is unclear what agency or organization has responsibility to restore these levees to the prescribed design capacity such that full Restoration Flows can be conveyed in the river. This an issue beyond the scope of this Revised Framework that will need to be addressed as the SJRRP moves forward. Recognizing that these levee stability actions need to occur to fully implement the Settlement, the costs are included in this Revised Framework. However, the costs of these actions are likely not the responsibility of the SJRRP and these actions should more appropriately be funded outside of the SJRRP. This may also be the case for improvements to the Reach 4B1 channel to allow for flows up to those identified in the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project. The responsible agency for levee stability improvements has not been identified, but it is assumed that California Department of Water Resources (DWR) would continue to lead the work on levee evaluations and improvements if State funds are available. The Framework only includes estimated Federal O&M costs for facilities and actions that the Secretary determines are needed to implement the Settlement. Nothing in the Settlement or Settlement Act changes the obligation of any long-term water contractor to pay conveyance and conveyance pumping O&M costs to a non-Federal operating entity.

Finally, the State has committed through the Memorandum of Understanding with the Settling Parties, dated September 13, 2006 and various letters from the State, see for example, the November 30, 2006 letter from Secretary Chrisman to Senator Feinstein and the May 5, 2008

[1] Costs are not of the level that Reclamation would typically use in making budget requests for funding large infrastructure projects. Budget requests will come annually from the Agencies and may not exactly match the Revised Framework, as the estimates will reflect real-time changes within each 5 year vision and will need to adjust for inflation.

letter from Governor Arnold Schwarzenegger to Senator Feinstein, to seek multi-benefit projects and funds equaling at least $200 million to support the restoration of the San Joaquin River. In 2006, Proposition 84 provided $100 million in funds to the Natural Resources Agency to be provided to DWR and the California Department of Fish and Wildlife (DFW) to support the Settlement. Approximately $21 million in Proposition 84 funds is still available to DWR to be appropriated and obligated. It is anticipated that funds from Proposition 1 will be made available to DFW and DWR to support State activities on the SJRRP. However, further funding will need to be identified for the State to continue to participate in the SJRRP at the levels envisioned in the Framework starting in Fiscal Year (FY) 2018. For purposes of this planning document, it is assumed that additional State funding will be forthcoming and continued participation is assumed. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding.

Table ES-3 shows a summary of Federal and State costs and funding sources as well as anticipated deficits or shortfalls assuming all stated commitments and appropriations are fulfilled.

Table ES-3. SJRRP Funding Needs and Sources (FY 2015 to FY 2029, in thousands)

	Funds in 2015 Dollars
Funding Needs Remaining	
Total Estimated Federal Funding Need	$1,106,913
Total Estimated State Funding Need	$137,277
Total Estimated State Funding Need with Levee Stability [1]	$443,954
Funding Sources Remaining	
SJRR Fund [2]	$356,730
CVP Restoration Fund ($2,448 annual)	$36,724
New Federal Appropriations (Part I)	$294,377
New Federal Appropriations (Part III, Friant Division Improvements)	$55,024
New Federal Appropriations (Water and Related) [3]	$35,014
State Authorized Funding Remaining	$50,900
Total Estimated Remaining Funding Sources	*$777,896*
Anticipated Shortfall in Federal Funding	***$329,044***
Anticipated Shortfall in State Funding	***$86,377***
Anticipated Non-SJRRP State Funding Needs	***$306,677***
Anticipated Shortfall in State Funding with Levee Stability	***$393,054***

Note: 1. The responsible agency for levee stability costs has not been determined; however, it is assumed that DWR would continue to lead levee evaluations and improvements if State funds are available. Levee stability costs are conservative and expected to decrease.

2. Includes estimated future Unreleased Restoration Flows sales, Recovered Water Account sales, and Friant surcharge collections.

3. Includes FY 2015 appropriations. Additional appropriations in the future are likely but amounts are unknown at this time and therefore, not included in this table.

Five Year Vision (FY 2015-2019)

The main focus of the Five Year Vision is to achieve at least 1,300 cfs capacity in all reaches of the San Joaquin River and completion of the Friant-Kern Canal and Madera Canal Capacity Restoration projects. Specifically, the goals are:

1. Provide flow connectivity and fish passage over major barriers to migration such that both adult and juvenile salmon can complete their migration routes without human assistance at the end of the 5 years.

    a. Complete seepage and levee stability projects to allow for flow up to the capacity of Reach 2B (at least 1,300 cfs).
    b. Complete components of the Mendota Pool Bypass or Fresno Slough Dam.
    c. Provide passage, if determined necessary, for anadromous salmonids at key barriers to migration.

2. Complete construction of the Friant-Kern Canal and Madera Canal Capacity Restoration Projects.

3. Continue to implement Water Management Goal actions and the Friant Division Improvements.

4. Continue Fish Establishment Activities.
    a. Complete construction of the Salmon Conservation and Research Facility.
    b. Obtain permit for wild stock collection and begin collecting wild stock.

From the Federal perspective, the SJRRP will be almost entirely reliant on Federal appropriations during the Five Year Vision. While currently $88 million is available for expenditure from the San Joaquin River Restoration Fund (SJRR Fund) not subject to appropriations, and $35 million is available for implementation of the Friant-Kern and Madera Canal Capacity Restoration projects, Reclamation anticipates fully obligating these “mandatory” funds by the end of FY 2017. Accordingly, the Five Year Vision assumes annual Federal appropriations ranging from $34 to $53 million, including $2.445 million per year in funds from the Central Valley Project (CVP) Restoration Fund ($2 million indexed to 2015 dollars). Overall, the SJRRP will be funding constrained and activities will be subject to the amount of appropriated funds.

Ten Year Vision (FY 2020-2024)

The main focus of the Ten Year Vision is to build out Reach 2B of the San Joaquin River channel and award all remaining financial assistance for local groundwater banking projects to reduce or avoid the impacts of the Restoration Flows. Specifically, the goals of the Ten Year Vision are:

1. Increase channel capacity to 4,500 cfs in Reach 2B.

2. Increase channel capacity to at least 2,500 cfs in all other reaches. This will allow for better control of water temperatures in the lower reaches during the spring pulse and reduce fish stress and mortality.

3. Complete planning, environmental compliance, and design for the Salt and Mud Slough Seasonal Barriers Project.

4. Make all major project decisions, including decisions on the following projects: identify the highest priority gravel pits in Reach 1 (Paragraph 11(b)(3)); and modifications to the Chowchilla Bypass Bifurcation Structure to provide fish passage and prevent entrainment (Paragraph 11(b)(2)).

5. Acquire all land and easements for all project elements including the Reach 2B Project and the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project.

6. Construct the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project.

7. Award all remaining funding for financial assistance for local groundwater banking projects.

8. Continue to implement Water Management Goal actions.

9. Continue collection of wild stock (assuming it started in the Five Year Vision).

From a Federal perspective, within the Ten Year Vision (FY 2020 to 2024), the SJRRP will reduce its reliance on Federal appropriations. Consistent with Section 10009(c)(2) of the Settlement Act, on October 1, 2019, the start of Federal FY 2020, all funds deposited into the San Joaquin River Restoration Fund become available for expenditure without further appropriation. It is estimated that $211,773,000 will be in the San Joaquin River Restoration Fund at the start of FY 2020. In addition, continued collections from the Friant Surcharge and Receipts from Sales of Water or Land are anticipated to result in $10,415,000 per year for the Restoration Program. In addition to these non-appropriated sources of funding, the Ten Year Vision assumes annual Federal appropriations ranging from $35 to $55 million, including $2.445 million per year in funds from the CVP Restoration Fund.

Additional funding for the continued participation of the State of California to support the implementation of the Settlement will be needed. However, for the purposes of this planning

document, it is assumed that State funding will be identified and continued participation is assumed for the Ten Year Vision. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding.

Fifteen Year Vision (FY 2025-2029)

The main focus of the Fifteen Year Vision is to complete the Phase 1 projects identified in Paragraph 11(a) of the Settlement and achieving full Restoration Flows. Specifically, the goals are:

1. Increase channel capacity in all reaches to 4,500 cfs.

2. Complete all remaining Phase 1 / Paragraph 11(a) projects including the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project and the Salt and Mud Slough Seasonal Barriers Project.

3. Complete planning and design activities and initiate construction for the remaining Phase 2 projects identified in Paragraph 11(b) of the Settlement, including filling and/or isolating the highest priority gravel pits in Reach 1 and modifications to the Chowchilla Bypass Bifurcation Structure to provide fish passage and prevent entrainment.

4. Continue implementing the Water Management Goal actions.

5. Complete annual spring-run donor stock collection and tagging, develop a phasing out strategy.

From a Federal perspective, within the Fifteen Year Vision, the SJRRP will again be heavily reliant on Federal appropriations. Some non-appropriated funds would be available from collections of the Friant Surcharge and water and land sales, if any, as part of the Program. However, these are expected to be small as compared to the overall funding need. Overall, the SJRRP will be funding constrained and activities will be subject to the amount of appropriated funds in the Fifteen Year Vision.

Additional funding for the continued participation of the State of California to support the implementation of the Settlement will be needed. However, for the purposes of this planning document, it is assumed that State funding will be identified and continued participation is assumed for the Fifteen Year Vision. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding.

Beyond Fifteen Year Vision (FY 2030+)

The main focus of the Beyond Fifteen Year Vision is to complete all remaining construction actions, monitor and maintain the system, achieve a naturally reproducing, self-sustaining

population of spring-run and fall-run Chinook salmon, and maximize SJRRP success. Specifically, the goals of the Beyond Fifteen Year Vision are as follows:

- Complete all remaining Phase 2 / Paragraph 11(b) projects.
- Complete all Paragraph 12 projects, if any are recommended.
- Monitor, operate, and maintain the SJRRP projects and fish actions.
- Achieve a naturally reproducing, self-sustaining population of spring-run and fall-run Chinook salmon by phasing out the Conservation Facility and donor stock collection efforts.
- Maximize SJRRP success.

At this time, it is difficult to predict the actual actions that would take place in the Beyond Fifteen Year Vision as many of these actions will depend on decisions not yet made and/or will depend on progress and actions within the previous years. Therefore, no detail, schedule, or costs are provided for these actions at this time as there is simply no way to determine this without a tremendous amount of uncertainty. However, in general, the Beyond Fifteen Year Vision focuses on a significant ramp down and completion of Program activities with a transition to ongoing monitoring, operations, and maintenance actions.

Establishment of Salmon Populations Vision

The Program is currently pursuing a number of ongoing activities that will further the establishment of self-sustaining and naturally reproducing salmon populations and improve upon the information included in this document. These activities include, but are not limited to, revising population targets and refining estimates of existing habitat. The timelines for projects in this Revised Framework outline a more specific sequence and longer process for completion of projects than described in the Settlement, and the process of establishing salmon populations will continue through the period of project completion. The Program is pursuing an inclusive process that will result in developing an updated Fisheries Framework for Implementation that considers the revised schedule in this Framework. The updated Fisheries Framework for Implementation is expected to be completed in May 2016. This Fisheries Framework will detail the following:

- Anticipated timelines for completion of renewed permits for spring-run salmon stock collection as well as a new permits for collection of wild stocks (if not included in the renewed permit);
- Roles and responsibilities of the Implementing Agencies with regard to fish actions;
- Objectives and key milestones for the establishment of spring-run and fall-run salmon in the Restoration Area through time;

- Objectives related to habitat and ecosystem conditions necessary to support salmon milestones and general plans for providing the habitat necessary to support the SJRRP's long-term population goals;

- Questions and data gaps that require additional research along with the schedule to resolve these data gaps and a general discussion of on-going and long-term monitoring needs;

- The need for a temporary or permanent project to assist juvenile outmigration; and,

- The desired timeline for removal of the Hills Ferry Barrier.

Conclusion

This Revised Framework is an update to the *Third Party Working Draft Framework for Implementation,* dated June 19, 2012. This Revised Framework provides a realistic Implementing Agency schedule and budget for the Framework actions based upon best available technical, schedule, and budget information. Estimated average annual Federal appropriations for the SJRRP are kept below $50 million. This results in longer timeframes for SJRRP implementation, but a more achievable schedule to inform stakeholders as well as internal SJRRP planning efforts. The more clearly defined roles and responsibilities documented here improve each Agency's ability to plan for the future.

The SJRRP will update this document as new information becomes available, in communication with Implementing Agencies, Settling Parties, the Restoration Administrator, and others as appropriate.

1.0 Introduction

This document is an update and revision to the *Third Party Working Draft Framework for Implementation*, dated June 19, 2012 (2012 Framework), and establishes a realistic schedule for the implementation of the San Joaquin River Restoration Program (SJRRP or Program) based upon the best available technical, biological, schedule, and funding information. Specifically, this Revised Framework establishes the following:

- Five year visions to provide clear, realistic, and accomplishable steps towards meeting the Restoration Goal and Water Management Goal in the Stipulation of Settlement in *NRDC, et al. v. Kirk Rodgers, et al.* (Settlement) and the San Joaquin River Restoration Settlement Act, Title X, Subtitle A, Part I of Public Law 111-11 (Settlement Act) and towards completing the "Friant Division Improvements" in Title X, Subtitle A, Part III of Public Law 111-11;

- Achievable schedules based upon realistic Federal and State of California appropriation levels, improving our ability to plan and be transparent on actions; and,

- More clearly defined roles and responsibilities for each Implementing Agency, increasing each agency's ability to budget, plan, and approve construction actions.

This Revised Framework provides a more realistic schedule and associated future funding needs for the SJRRP Implementing Agencies to focus on implementation of the Settlement, Settlement Act, and Friant Division Improvements. This Revised Framework is primarily focused on activities necessary to plan, permit, design, and construct major physical project elements of the SJRRP. Table 1-1 details the actions scheduled for completion during each five year vision in this Revised Framework. Table 1-2 details the anticipated costs for the SJRRP actions, while Figure 1-1 shows the Restoration Area.

This Revised Framework is a "living" document and additional updates will be made as additional information is gained and milestones are reached. In addition, this Revised Framework represents a path forward in compliance with the Settlement and Settlement Act, but may not encompass all of the actions that may ultimately be taken to implement the SJRRP. The ultimate implementation of the SJRRP will be shaped by decisions made through planning processes that are part of the SJRRP, such as the Fisheries Management Plan, environmental processes, permit requirements, and adaptive management.

The Draft Revised Framework was provided for a 30 day public review period to solicit comments and suggestions on how best to implement the Settlement and Settlement Act from agencies, organizations, and members of the public. Nine comment letters were received on the Draft Revised Framework. The comment letters along with the responses to those comments are provided in Appendix J. This document reflects updates based on the comments received.

Table 1-1. Schedule of Key Construction Actions

2015-2019	2020-2024	2025-2029	2030+
Goal: At least 1,300 cfs Capacity in all Reaches	Goal: Increased Capacity	Goal: Phase 1 Projects Complete	Goal: All Remaining Projects
• Friant-Kern Capacity Restoration • Madera Canal Capacity Restoration • Mendota Pool Bypass • Temporary Arroyo Canal Screen and Sack Dam Passage • Conservation Facility • Seepage Projects to at least 1,300 cfs	• Financial Assistance for Groundwater Banks • Reach 2B • Arroyo Canal and Sack Dam • Reach 4B Land Acquisition • Seepage Projects to 2,500 cfs • Levee Stability to 2,500 cfs	• Reach 4B • Salt and Mud Sloughs • Chowchilla Bifurcation Structure Modifications • Highest Priority Gravel Pits • Seepage Projects to 4,500 cfs • Levee Stability to 4,500 cfs	• Ongoing Operations and Maintenance

Note: cfs = cubic feet per second

1. The Revised Framework is primarily focused on activities necessary to plan, permit, design, and construct major physical project elements of the SJRRP.

Table 1-2. SJRRP Project and Activity Estimated Costs (in millions)

	2012 Framework (Various $ Years)	2015 Revised (2015 $)
Staffing and Administration	$78	$124[1]
Flow Actions		
Conservation Strategy / Mitigation Measures	$35	$38
Flows	$45	$26[2]
Channel and Structural Improvements		
Mendota Pool Bypass and Reach 2B	$312	$336[3]
Reach 4B, Eastside Bypass and Mariposa Bypass	$156	$274[4]
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$25	$31
Salt and Mud Slough Seasonal Barriers	$14	$6
Passage at Key Barriers	Part of 4B	$6
Fish Establishment		
All Other Fish Establishment Actions	$27	$12
Conservation Facility	$21	$26
Water Management Goal & Friant Division Improvements	$100	$96
Total	**$813**	**$974**
Seepage Projects	$79	$189[5]
Chowchilla Fish Passage	N/A	$20
Gravel Pits Filling or Isolation	N/A	$14
Miscellaneous	N/A	$49
Total Settlement & Friant Division Improvements	**$892**	**$1,244**
Levee Stability	$189	$307[6]
Total	**$1,081**	**$1,551**

Notes:
1 Additional costs include addition of California Department of Fish and Wildlife (DFW) staff costs and reflection of 5 additional years shown on schedule.
2 Does not anticipate costs for related to Unexpected Seepage Losses and reduced monitoring.
3 Excludes Mendota Pool Fish Screen costs as fish entrainment would be an infrequent occurrence. Updated land acquisition costs and operation and maintenance costs, indexed cost estimates to April 2015.
4 Average cost of all Reach 4B alternatives. Framework only considered Eastside Bypass. Updated land acquisition and O&M costs and added Eastside Bypass setback levees, indexed cost estimates to April 2015.
5 Updated land acquisition costs and included operation and maintenance costs.
6 Updated based on hydraulic modeling and slurry wall costs, included staff time. Levee stability costs are likely to decrease.

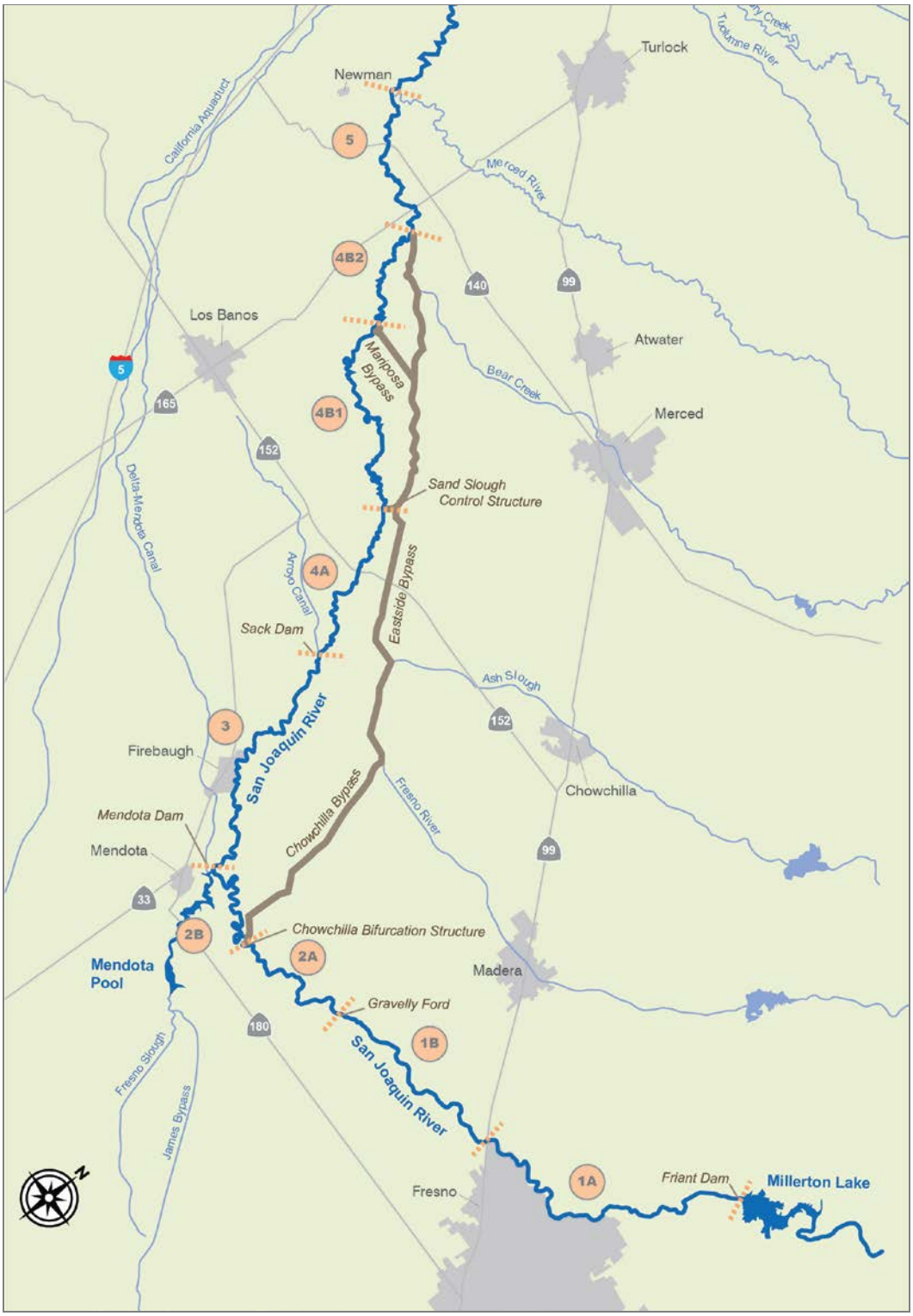

Figure 1-1. Restoration Area

1.1 Framework Background

In June 2012, the SJRRP prepared and released the Framework. The 2012 Framework made use of new information to provide a revised schedule and budget to guide SJRRP activities. The 2012 Framework identifies:

1. Conditions necessary to reintroduce Chinook salmon into the San Joaquin River in light of existing and anticipated river conditions, and in a manner consistent with the Settlement and Settlement Act.

2. Implementing Agencies' priorities in achieving the Restoration Goal and Water Management Goal.

3. Actions that require additional information, and establishes the relative benefits and costs before committing resources to those actions.

4. Actions that can be undertaken incrementally, while preserving the flexibility to adjust and adapt as the Implementing Agencies learn more about actions that may benefit the Restoration Goal and Water Management Goal.

5. Actions as "core", "secondary", and "improvement" actions. In addition, the 2012 Framework focused the near-term scope, schedule, and budget of the SJRRP to the "core" actions.

    - "Core": actions considered essential to the success of the SJRRP, where the Implementing Agencies are certain that the action will result in a positive outcome, and where the absence of action would result in program failure.

    - "Secondary": actions where the Implementing Agencies have a high level of confidence in a beneficial outcome, but where the absence would not result in the failure to achieve the goals of the Settlement and Settlement Act. For the Restoration Goal, some of these secondary actions may be required to address the potential cumulative effects of fishery impairments. Information gained through monitoring and analysis may result in secondary actions becoming core or improvement actions.

    - "Improvement": actions with uncertain benefits to the overall SJRRP. These actions are thought to increase the SJRRP's success, but additional study and analysis is needed. Information gained through monitoring and analysis may result in these actions becoming secondary or core actions.

1.2 Accomplishments and Remaining Actions

The original schedule for implementation envisioned in the Settlement was ambitious by design and reflected the Parties' intent that the improvements be completed in an expeditious manner. Many assumptions were made in developing the schedule, and while the Parties' have exercised due diligence, some actions are unavoidably behind schedule. That said, many of the planning

and management actions that establish the foundation of the SJRRP have been accomplished. This includes the following:

- Release of Interim Flows. This included developing and implementing a flow monitoring program and a process to avoid seepage impacts on adjacent agricultural lands (see Seepage Management Plan and Seepage Project Handbook).
- Completion of the SJRRP's Program Environmental Impact Statement/Report (PEIS/R), Record of Decision (ROD), and Notice of Determination (NOD). These documents provide program-level National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance for all actions in the Settlement and some actions in the Settlement Act along with project-level NEPA compliance for the release of Interim and Restoration flows.
- Completion of modifications to the Bureau of Reclamation's (Reclamation's) water rights permits at Friant Dam to implement the release of Interim and Restoration flows provided in the Settlement on a long-term basis.
- Completion of the rules and permits necessary to implement the SJRRP's spring-run broodstock and direct release efforts.
- Completion of the Restoration Flow Guidelines and beginning of Restoration Flows.
- Completion of modification to the Friant Division long-term contracts consistent with the Settlement Act.
- Completion of an Environmental Impact Report and NOD for construction and operation of the Salmon Conservation and Research Facility (Conservation Facility), release of Chinook salmon to the Restoration Area, and fisheries monitoring and research actions.

Tables 1-3 and 1-4 provide a summary of the accomplishments and remaining actions to implement the Settlement and Settlement Act, respectively. An extensive list of SJRRP accomplishments as of June 2015 is provided in Appendix A.

Table 1-3. Accomplishments and Remaining Actions to Implement the Settlement

Paragraph[1]	Project[2]	Accomplishments	Action(s) Remaining
11(a)(1) 11(a)(2)	Mendota Pool Bypass and Reach 2B conveyance of 4,500 cubic feet per second (cfs)	• Public Draft Environmental Impact Statement / Report (EIS/R) • Series of Technical Memorandum for early design efforts, environmental compliance, and permitting efforts • Design data collection, including extensive geotechnical drilling	• Final EIS/R • Record of Decision and Notice of Determination • Final design and land acquisition • Construction and on-going operations and maintenance
11(a)(3), 11(a)(4), 11(a)(5), 11(a)(8) 11(a)(9)	Reach 4B conveyance of 475 cfs; modify Reach 4B headgates, Sand Slough Control Structure, Eastside and Mariposa bypasses to ensure fish passage; modify structures in Eastside and Mariposa Bypass for fish passage; and, potentially modify Eastside and Mariposa Bypass to establish a low-flow channel	• Issuance of Notice of Preparation and Notice of Intent • Initial Alternatives Technical Memorandum • Project Description Technical Memorandum	• Finalize alternatives • Public Draft and Final EIS/R • Record of Decision and Notice of Determination • Final design and land acquisition • Construction and on-going operations and maintenance
11(a)(6) 11(a)(7)	Screen Arroyo Canal to prevent entrainment of fish and modify Sack Dam to ensure fish passage	• Draft and Final Environmental Assessment/Mitigated Negative Declaration • Finding of No Significant Impact • 60 percent design drawings • Federal Endangered Species Act (ESA) compliance	• On hold pending resolution by San Luis Canal Company on its next steps with local subsidence issues • Potential complete redesign to account for subsidence and obtain new or modified permits • Construction and on-going operations and maintenance
11(a) (10)	Barriers at Salt and Mud sloughs	• None	• Project Management Plan • Alternatives development and design drawings • Environmental compliance alternatives • Construction and on-going operations and maintenance

Table 1-3. Accomplishments and Remaining Actions to Implement the Settlement

Paragraph[1]	Project[2]	Accomplishments	Action(s) Remaining
11(b)(1)	Modify Reach 4B to convey 4,500 cfs, unless determined not to substantially enhance achievement of the Restoration Goal	• Issuance of Notice of Preparation and Notice of Intent • Initial Alternatives Technical Memorandum • Project Description Technical Memorandum	• Finalize alternatives • Public Draft and Final EIS/R • Record of Decision and Notice of Determination • Final design and land acquisition • Construction and on-going operations and maintenance
11(b)(2)	Modify Chowchilla Bifurcation Structure to provide fish passage and prevent entrainment	• None	• Environmental Compliance • Design • Construction
11(b)(3)	Fill and/or isolate highest priority gravel pits in Reach 1	• None	• Environmental Compliance • Design • Construction
11(b)(4)	Modify Sand Slough Control Structure to enable routing and conveyance of up to 4,500 cfs	• Issuance of Notice of Preparation and Notice of Intent • Initial Alternatives Technical Memorandum • Project Description Technical Memorandum	• Finalize alternatives • Public Draft and Final EIS/R • Record of Decision and Notice of Determination • Final design and land acquisition • Construction and on-going operations and maintenance
12	Additional channel and structural improvements recommended by the Restoration Administrator	• Completed draft report on the Viability of the Use of the Chowchilla Bypass	• Respond when additional recommendations are made
13(c)	Unexpected Seepage Losses	• Process established in the Restoration Flows Guidelines	• Analysis of actual unexpected seepage losses, including location and biological need • Purchase of prescribed volumes from willing sellers

Table 1-3. Accomplishments and Remaining Actions to Implement the Settlement

Paragraph[1]	Project[2]	Accomplishments	Action(s) Remaining
13(f)	Prevention and redress of increased downstream surface or underground diversions above those assumed in Exhibit B	• Provided letters and worked to address specific diversion concerns • Process established in the Restoration Flows Guidelines	• Annual meeting of the Parties • Address on an as needed basis for the duration of the SJRRP
13(g)	Measure and monitor Restoration Flows to ensure compliance with Exhibit B	• Additional gages installed and on-going monitoring since October 2009 • Process established in the Restoration Flows Guidelines	• Ongoing measuring and monitoring for the duration of the SJRRP
13(h)	Retain, acquire and perfect all rights to manage and control all Interim Flows and Restoration Flows	• State Water Resources Control Board (SWRCB) orders protecting Interim Flows • SWRCB order modifying water rights at Friant Dam to implement Interim and Restoration flows on a long-term basis	• Complete, no further action anticipated except to continue to meet the commitments made in the SWRCB order
13(i)	Commence Restoration Flows no later than January 1, 2014; Manage Unreleased Restoration Flows	• Release of Restoration Flows on January 1, 2014 • Technical Memorandum on the Management of Unreleased Restoration Flows	• Ongoing implementation for the duration of the SJRRP
13(j)	Restoration Flows Guidelines	• Completed December 30, 2014	• Ongoing implementation for the duration of SJRRP • Revisions as necessary for the duration of the SJRRP

Table 1-3. Accomplishments and Remaining Actions to Implement the Settlement

Paragraph[1]	Project[2]	Accomplishments	Action(s) Remaining
14	Reintroduce spring and fall run Chinook salmon	• Fisheries Management Plan, Hatchery and Genetics Management Plan, Strategy for Spring-run Chinook Salmon Reintroduction, and permit applications • Trapped and transported fall-run salmon starting in 2012 and continuing to present • Natural spawning of fall-run in fall 2012 and naturally produced fall-run in spring 2013, continues yearly • Initiated spring-run broodstock efforts in 2013 • Completed special rules to allow release of spring-run, consistent with applicable law • Constructed and began operations of the Interim Conservation Facility • Commenced direct releases of spring-run into the San Joaquin River in 2014	• Continue spring-run broodstock efforts and direct releases of spring-run into the river • Begin using wild spring-run stock for broodstock efforts • Construct permanent Salmon Conservation and Research Facility, including water supply for the facility • Begin releases of spring-run from the Conservation Facility • Remove Hills Ferry Barrier and allow fall-run to recolonize the San Joaquin River • Continue study and adaptive management efforts • Fisheries Framework may identify further actions
14(a)	U.S. Fish and Wildlife Service (USFWS) to submit a permit application to National Marine Fisheries Service (NMFS) for the reintroduction of spring-run Chinook salmon	• USFWS submitted two permit applications, one for broodstock and one for direct release of spring-run. Both applications requested 5 years terms • NMFS issued Section 10(a)(1)(A) Permit 14868 on October 11, 2012 • NMFS issued Section 10(a)(1)(A) Permit 17781, in March 2014, for direct release of spring-run into the San Joaquin River • About 50,000 spring-run juveniles released in 2014 and 2015	• Existing permits are limited to 5 years, expiring in 2017 for broodstock and 2019 for direct release. Extension of the existing permits or new permits will be needed in the future • Permit for future take of wild spring-run

Table 1-3. Accomplishments and Remaining Actions to Implement the Settlement

Paragraph[1]	Project[2]	Accomplishments	Action(s) Remaining
14(b)	Include Restoration Administrator's recommendations in planning and decision-making for reintroduction actions	• Recommendations for fall-run and spring-run included to-date	• Ongoing for the duration of the SJRRP
15	Interim Flows and associated monitoring program	• Commencement of Interim Flows on October 1, 2009 • Establishment of monitoring network • Completion of Interim Flows on December 31, 2013	• Complete, no further action anticipated
16(a)	Plan for recirculation, recapture, reuse, exchange or transfer of Interim Flows and Restoration Flows	• 2010, 2011, 2012, 2013, and 2014 program of recirculation, recapture, reuse, exchange or transfer of Interim Flows and Restoration Flows • 2010, 2011, 2012, and 2013-2017 Environmental Assessment and Finding of No Significant Impact • Draft Recapture and Recirculation Plan, dated February 2011 • Recaptured and recirculated over 286,000 acre-feet or approximately 50 percent of the SJRRP releases through February 28, 2014	• Revise Draft Plan • Finalize recirculation alternatives • Public Draft and Final EIS • Record of Decision and Notice of Determination • Final design and construction (if included in Plan) • Ongoing implementation for the duration of the SJRRP
16(b)	Recovered Water Account	• Methodology to determine water supply impacts in the Restoration Flows Guidelines • Allocated 680,440 acre-feet of Recovered Water Account credits • Delivered 365,200 acre-feet of Recovered Water Account water to date	• Ongoing implementation of methodology and allocation of Recovered Water Account credits for the duration of the SJRRP

Table 1-3. Accomplishments and Remaining Actions to Implement the Settlement

Paragraph[1]	Project[2]	Accomplishments	Action(s) Remaining
18	Consider and implement the Restoration Administrators flow recommendations	• Recommendations implemented to-date	• Ongoing for the duration of the SJRRP
19(a)	Develop procedures, as appropriate, for coordinating technical assistance, regulatory compliance, and sharing of information with other Federal and State agencies, Restoration Administrator, and Technical Advisory Committee	• SJRRP Program Management Plan in 2007 and established a series of working group consistent with the Plan	• Ongoing implementation of the SJRRP Program Management Plan and work group structure for the duration of the SJRRP
19(b)	Provide opportunities for input from third parties and the public	• SJRRP Program Management Plan in 2007 and established a series of public technical feedback group consistent with the Plan • Memorandum of Understanding with the Third Parties in 2007	• Ongoing opportunities for third party and public input for the duration of the SJRRP
22	Amend Friant Division and the Hidden and Buchanan Units water service contracts to add specific language related to the Settlement	• Conversion of Friant Contracts from 9(e) to 9(d)	• Complete, no further action anticipated

1. Only those Settlement paragraphs that include implementation actions are included.
2. Short summaries are not intended to be all inclusive. Refer to the Settlement paragraph for more information and detail.
3.

Table 1-4. Accomplishments and Actions Remaining to Implement the Settlement Act

Section[1]	Project[2]	Accomplishments	Action(s) Remaining
10004(a)(1)	Design and construct channel and structural improvements identified in Paragraph 11 of the Settlement	• *See discussion for Paragraphs 11(a) and 11(b) in Table 3-1*	• *See discussion for Paragraphs 11(a) and 11(b) in Table 3-1*
10004(a)(2)	Modify Friant Dam operations to provide Interim Flows and Restoration Flows	• *See discussion for Paragraphs 13 and 15 in Table 3-1*	• *See discussion for Paragraphs 13 and 15 in Table 3-1*
10004(a)(3)	Acquire water, water rights, or options to acquire water as described in Paragraph 13 of the Settlement	• *See discussion for Paragraph 13 in Table 3-1*	• *See discussion for Paragraph 13 in Table 3-1*
10004(a)(4)	Implement the plan for recirculation, recapture, reuse, exchange or transfer plan in Paragraph 16(a) of the Settlement	• *See discussion for Paragraph 16(a) in Table 3-1*	• *See discussion for Paragraph 16(a) in Table 3-1*
10004(a)(5)	Develop and implement the Recovered Water Account as specified in Paragraph 16(b)	• *See discussion for Paragraph 16(b) in Table 3-1*	• *See discussion for Paragraph 16(b) in Table 3-1*
10004(d)	Identify impacts and measures which shall be taken to mitigate impacts on adjacent and downstream water users and landowners prior to implementing decisions to agreements to construct, improve, operate or maintain facilities.	• *See discussion for Paragraphs 11(a), 11(b) and 12 in Table 3-1*	• *See discussion for Paragraphs 11(a), 11(b) and 12 in Table 3-1*
10004(h)(1)	Prior to releasing Interim Flows, complete an analysis in compliance with the NEPA	• Completed several Environmental Assessments and Supplemental Environmental Assessments for Interim Flows	• Complete, no further action anticipated

Table 1-4. Accomplishments and Actions Remaining to Implement the Settlement Act

Section[1]	Project[2]	Accomplishments	Action(s) Remaining
10004(h)(3)	Reduce Interim Flows to the extent necessary to address any material adverse impact to Third Parties from groundwater seepage	• Interim Flows were managed and reduced to the extent necessary to address any material adverse seepage impacts • Financially compensated landowner that experienced material adverse seepage impacts from Interim Flows • Seepage Management Plan	• Complete, no further action anticipated
10004(h)(4)	Evaluate the effectiveness of the Hills Ferry Barrier in preventing the unintended upstream migration of anadromous fish	• Evaluations were completed in 2010 and 2011 and reports were prepared as part of the SJRRP's Annual Technical Report process	• Complete, no further action anticipated
10009(f)(1)	Study that specifies the cost of undertaking work in Reach 4B, impacts associated with reintroduction of flows, and measure that shall be implemented to mitigate impacts.	• Study completed in December 2013	• Complete, no further action anticipated
10009(f)(2)	File a report with Congress no later than 90 days after issuance of a determination on whether or expand the Reach 4B channel to 4,500 cfs or use an alternative path for pulse flows	• None	• Complete the report in conjunction with the NEPA/CEQA effort for the Reach 4B project
10010	Convert the Friant Division, Hidden Unit, and Buchanan Unit contractors from water service contracts to repayment contracts under section 9(d) of the Act of August 4, 1939	• *See discussion for Paragraph 22 in Table 3-1*	• *See discussion for Paragraph 22 in Table 3-1*
10011(c)(2)	Rule pursuant to section 4(d) of the Endangered Species Act governing the incidental take of reintroduced spring-run salmon	• Rule issued on December 31, 2013	• Implement technical memorandum actions for the duration of the rule

Table 1-4. Accomplishments and Actions Remaining to Implement the Settlement Act

Section[1]	Project[2]	Accomplishments	Action(s) Remaining
10011(d)	Secretary of Commerce report to Congress on the progress made on the reintroduction, no later than December 31, 2024	• None	• Complete monitoring actions that may be necessary for the Secretary of Commerce to complete the report and complete the report
10201(a)(1)	Friant-Kern Canal Capacity Restoration Project	• Draft feasibility study and Environmental Assessment for the Friant-Kern Canal Capacity Restoration Project completed in 2011 • 60-percent design	• Cooperative Agreements with Friant Water Authority • Final design and construction
10201(a)(1)	Madera Canal Capacity Restoration Project	• Feasibility Study contract	• Construct demonstration projects • Finalize alternatives • Public Draft and Final EA • Finding of No Significant Impact • Final design and construction
10201(a)(2)	Friant-Kern Canal Reverse Flow Pump-Back Project	• Preliminary designs and environmental compliance • Acquisition of pumps and motors from Temporary Red Bluff Pumping Plant	• Complete Feasibility Study • Implement construction actions as a secondary action
10202	Financial assistance to local agencies for the planning, design, environmental compliance, and construction of local facilities to groundwater banking facilities	• Part III Guidelines • FY 2013, Reclamation awarded $14.29 million to four projects and provided $10 million in funding. With local cost-share contributions, more than $39.6 million in groundwater improvements will be implemented with a projected yield over 760,000 acre-feet during the projects' 30-year life cycle, approximately 25,000 acre-feet/year	• Construction of groundwater banking facilities • Award remaining funds

1. Only those Settlement Act sections that include implementation actions are included.
2. Short summaries are not intended to be all inclusive. Refer to the Settlement Act sections for more information and detail.

1.3 Development of this Revised Framework

This Revised Framework was developed using an extensive outreach process that, in total, has taken over a year to complete. An administrative draft of this Revised Framework was provided to the Settling Parties, Third Parties, and interested members of the public in July 2014. A series of five facilitated meetings that were open to the Implementing Agencies, Settling Parties, and Third Parties along with interested members of the public were held from October 2014 to March 2015. As part of this effort, several small groups were developed to address specific concerns identified at the facilitated meetings. A summary of the meetings and the outcomes of the small groups are provided below.

A Draft Revised Framework was provided for a 30 day public review period to solicit comments and suggestions on how best to implement the Settlement and Settlement Act from agencies, organizations, and members of the public from May 15 to June 15, 2015. Nine comment letters were received on the Draft Revised Framework. The comment letters along with the responses to those comments are provided in Appendix J. This document reflects updates based on the comments received.

1.3.1 Facilitated Meetings

A series of five facilitated meetings were held to receive comments and input on the July 2014 Administrative Draft Revised Framework from October 2014 to March 2015. The Implementing Agencies, Settling Parties, and Third Parties along with interested members of the public were invited, with over 70 individuals invited to each meeting. All meeting agendas, presentations, and summaries are provided in Appendix B. Below is a summary of the meetings.

The first meeting was held on October 27, 2014. The goals for the first meeting were to establish common expectations on the process for updating the Framework; provide participants with an overview on the need and purpose for updating the Framework; establish a common understanding of the Settlement, Settlement Act, July 2014 version of the Revised Framework, Program funding, and constraints that Reclamation faces in implementing the Settlement and Settlement Act; and demonstrate and provide participants with a tool to develop their own schedule and priorities for implementing the Settlement and Settlement Act.

The second meeting took place on November 24, 2014. This meeting focused on the spreadsheet tool that Reclamation provided to participants that allowed them to work within Program parameters to formulate their ideas of how to approach implementation of the Settlement and Settlement Act within the constraints faced by Reclamation.

The third meeting was held on December 19, 2014. Participants, including representatives from Friant Water Authority, the Friant Districts, the Natural Resources Defense Council, and the downstream landowners and water districts, presented their ideas on how they would implement the Settlement and Settlement Act within Reclamation's constraints. Based on the presentations at the meeting, Reclamation formed a series of small groups to address specific topics and bring information back to the larger group. The five small groups formed at this meeting were: Construction Approach and Stranded Assets; Endangered Species Act (ESA) Listed Fish

Species; Program Management Transparency Improvements; Recirculation Costs; and Unreleased Restoration Flows.

The fourth meeting was held on February 5, 2015, and consisted of updates from the five small groups and the next steps for development of the Framework.

The fifth and final stakeholder meeting for the Framework process on was held on March 11, 2015. Small group efforts wrapped up in preparation for this larger group meeting. All suggested changes submitted at the December 19, 2014, meetings were evaluated and determinations were made whether they could be accepted, accepted with modifications, or could not be accepted. At the meeting, Reclamation addressed the comments given at the December meeting by Friant, the Exchange Contractors, and the Natural Resources Defense Council. Two additional small groups were formed at this meeting, the Other Funding Sources small group and the Fish Chapter small group.

1.3.2 Small Group Efforts

As described in Section 1.3.1 above, a series of small groups were developed to address specific topics and bring information back to the larger group. The small groups included members of the Implementing Agencies, Settling Parties, and Third Parties. The purpose and efforts of each small group are summarized below.

Construction Approach, Stranded Assets

The purpose of the Construction Approach / Stranded Assets small group was to discuss the decision making process for construction projects and funding of construction projects in Reclamation along with how Reclamation prevents incomplete projects. The group met two times and developed Appendix C.

ESA Listed Fish Species

The purpose of the ESA Listed Fish Species small group was to identify ESA liabilities for the Exchange Contractors, discuss solutions, and differentiate Program requirements from non-Program requirements. The group met three times and developed Appendix D.

Fish Chapter

The purpose of the Fish Chapter small group was to revise the fish chapter in this Revised Framework. The group met four times and developed Chapter 8.0 of this Revised Framework.

Other Funding Opportunities

The Other Funding Opportunities small group brainstormed possible other funding sources for the SJRRP. The group met twice and developed Appendix E.

Program Management Transparency Improvements

The Program Management Transparency Improvements small group identified challenges to management and transparency, and brainstormed solutions. This group also discussed “triggers” for revisions to this Revised Framework. The group met three times and largely developed the text in Section 2.3 of this Revised Framework.

Recirculation Costs

The Recirculation Costs small group discussed options and costs for recirculation of recaptured Restoration Flows. The group met two times and developed Appendix F.

Unreleased Restoration Flows

The Unreleased Restoration Flows small group used assumptions on channel capacity and the value of water to provide bookends on the maximum and minimum revenue expected from the sale of Unreleased Restoration Flows. The group met one time and developed Appendix G.

2.0 Implementation Approach

2.1 Vision Approach

This Revised Framework prioritizes SJRRP actions to ensure efficient use of resources and expeditious construction of SJRRP actions. In order to accomplish this, projects and activities have been prioritized into five year increments, with a focused "vision" for each five year increment. Each vision: (1) limits and focuses actions to what can realistically be achieved within the five year span, based upon the best information currently available; and, (2) is formulated to make incremental and measurable progress in achieving the goals of the Settlement.

All of the channel and structural improvement projects identified in Paragraph 11(a) and 11(b) of the Settlement are included. However, the more realistic funding outlay and updated prioritization necessitates dividing some of the larger actions into smaller components and having a delayed implementation schedule across several five year visions. While the Agencies will continue with the environmental compliance as one large project, the design and construction may be broken into smaller and more manageable increments. The delayed implementation of some of these projects may require temporary actions that were not originally identified in the 2012 Framework, but are critical to addressing SJRRP needs while the long-term solutions are phased into completion.

Estimated costs are identified for each year; however, it is recognized that activities and actual costs will vary from year to year and the emphasis is to complete all activities within each five year vision at the overall cost. This provides the year to year flexibility necessary for a program of the size, magnitude, and complexity of the SJRRP to adjust as some actions take longer or shorter than originally planned. As additional funding becomes available beyond the amount needed in each five year vision, activities from the next five year vision will be prioritized to the extent practical.

Five Year Vision (FY 2015-2019)

The main focus of the Five Year Vision is to provide additional channel capacity in the San Joaquin River and complete two of the Friant Division Improvement projects (the Friant-Kern Canal and Madera Canal Capacity Restoration).

Ten Year Vision (FY 2020-2024)

The main focus of the Ten Year Vision is to build out Reach 2B, implement the Arroyo Canal and Sack Dam project, and award all remaining financial assistance for local groundwater banking projects to reduce or avoid the impacts of the Restoration Flows. Channel capacity will be increased to approximately 2,500 cfs throughout all reaches via seepage and levee stability projects. Planning, environmental compliance, and design for the Salt and Mud Sloughs Seasonal Barriers Project will be completed. All project decisions will be made, such as the determination of highest priority gravel pits, and whether modifications to the Chowchilla Bypass Control Structure are needed.

Fifteen Year Vision (FY 2025-2029)
The main focus of the Fifteen Year Vision is to complete the remaining Phase 1 and Phase 2 channel and structural improvement projects in Paragraph 11(a) and 11(b) of the Settlement and achieve full Restoration Flows.

Beyond Fifteen Vision (FY 2030+)
The main focus of the Beyond Fifteen Year Vision is to complete all remaining construction actions, monitor and maintain the system, achieve a naturally reproducing, self-sustaining population of spring-run and fall-run Chinook salmon, and maximize achievement of the SJRRP.

2.2 Program-wide Uncertainties

Uncertainties for the entire SJRRP include:

- State funding – State funding after 2017 is uncertain, although the State has committed through the Memorandum of Understanding with the Settling Parties, dated September 13, 2006 and various letters from the State, see for example, the November 30, 2006 letter from Secretary Chrisman to Senator Feinstein and the May 5, 2008 letter from Governor Arnold Schwarzenegger to Senator Feinstein, to seek multi-benefit projects and funds equaling at least $200 million to support the restoration of the San Joaquin River.
- Federal and State annual appropriations – The ability of Reclamation to obtain Federal appropriations in amounts needed in any given year to implement this Revised Framework is uncertain. However, this Revised Framework has been written to limit activities based on a reasonable level of assumed annual appropriations. If the annual appropriations are not sufficient to meet all of the needs in the Framework, Reclamation will work to prioritize actions within the year, most likely focusing on funding construction projects first. California Department of Water Resources (DWR) and California Department of Fish and Wildlife (DFW) face a similar challenge with State appropriations.
- Costs – There are a variety of uncertainties related to costs, primarily that cost estimates are based on preliminary designs and may increase or decrease due to a variety of factors including more detailed designs, geotechnical investigations, fish passage design criteria, subsidence, selection of a preferred alternative, and similar. The levee stability cost, estimated to be $300 million, are conservative and are expected to decrease significantly based on geotechnical analysis on the levees currently underway by DWR. However, the cost estimates included in this Revised Framework are the best available information that the Implementing Agencies currently have.
- Projects Not Included – This Framework includes all Paragraph 11(a) and 11(b) projects. No costs are included for most other projects, including possible segregation weirs, permanent trap and haul facilities, gaging station weirs, Paragraph 12 projects, fish counting weirs, and similar. Any projects such as these that are outside of specific funding line items in this document would need to be funded, to the extent possible, using the annual $2 million Miscellaneous funds.

- Unexpected Seepage Losses – While Reclamation can develop cost-neutral banking, storing, exchange, transfer, and sale on water and options for specific quantities, the ability to reach the quantities called for in the Settlement is unknown. In addition, Reclamation expects to use Unreleased Restoration Flows to accomplish the Unexpected Seepage Loss banking requirements in Paragraph 13 of the Settlement.
- Friant-Kern and Madera Canals Capacity Restoration Projects – Consistent with Section 10203(a) of the Settlement Act, this project is not to exceed $35 million. The extent and scope of the projects are highly uncertain due to their limited budgets. In addition, Reclamation management and the Solicitors Office have not yet determined that the $35 million allocated to these two projects is "mandatory" funds (not subject to appropriation) from the San Joaquin River Restoration Fund (SJRR Fund). This Revised Framework assumes that these projects can be funded with SJRR Fund monies not subject to appropriation, as the Reclamation SJRRP Office continues to work through this internally.
- Levee improvements – Spending funds in the Eastside Bypass in the short term on levee improvements to allow higher flows, when the permanent route could be different, will be challenging. The SJRRP is hoping to reach a preferred alternative for the Reach 4B project in summer 2016 to inform short-term decisions.

Annual Work Plans will report information on the implementation of the Revised Framework which will include work being done to reduce the key uncertainties facing the SJRRP.

2.3 Tracking Implementation of this Revised Framework

As part of the process to prepare this Revised Framework, the Implementing Agencies, Settling Parties, Restoration Administrator, and Third Parties (for this discussion, the group is collectively referred to as the "team" in this section) were invited to discuss a series of Program management and Program transparency improvements. The following improvements will be implemented as the SJRRP works to implement this Revised Framework:

1. **Program Management Commitment #1 – Comprehensive Program Schedule: Comprehensive, detailed Program schedule, updated quarterly. Quarterly meetings to review progress and challenges.**

   Some members of the team noted that it was difficult to track progress, identify and track critical path items, and understand upcoming actions for the Program. To address this, the Implementing Agencies will create a comprehensive, detailed schedule that identifies all SJRRP actions. One master schedule for the entire SJRRP will be developed at a more general level. This master schedule will identify all of the individual projects within the SJRRP and linkages between those projects. Detailed project schedules will be created for each individual project. While the master schedule will be maintained by Reclamation, the master schedule will rely on the individual project schedules, which will be maintained by the respective individual project manager within each Implementing Agency. The Implementing Agencies will update the schedule quarterly and hold quarterly meetings to discuss progress and challenges.

2. **Program Management Commitment #2 – Quarterly Budget Execution Check-ins: Implementing Agencies to track progress on executing the budget by project in the Annual Work Plan, updated quarterly. Quarterly meetings, in coordination with item #1 above, to review progress and challenges.**

   Some members of the team noted that it was difficult to track execution of the funds in the Annual Work Plan. To address this, the Implementing Agencies will create and maintain a table showing planned funding for the fiscal year by project. The table will be updated quarterly and discussed at the quarterly meetings identified in #1 above to show budget execution and planned execution for the remainder of the year. Reclamation will maintain one table for the Federally-funded actions. DFW and DWR will maintain their own tables for their respective actions.

3. **Program Management Commitment #3 – Quarterly Staffing Updates: Implementing Agencies to develop organizational charts for their offices and discuss staffing changes at the quarterly meetings identified in item #1 above.**

   Some members of the team noted that there tended to be a significant number of openings or vacancies in the Implementing Agencies that limit the ability of the agencies to accomplish key projects and activities. The Implementing Agencies noted that filling vacancies is always a challenge for a variety of reasons. Overall, it was recognized that the Agencies have to follow their respective policies and procedures. However, developing organizational charts that can be shared with the Implementing Agencies, Settling Parties, Restoration Administrator, and Third Parties and reporting staff changes and updates at the quarterly meetings would be helpful to both: (1) understand changes so it is clear who is leading what projects and activities and who to contact with questions on certain projects or activities; and, (2) understand the staffing limitations of the agencies in accomplishing work and how the agencies plan to address those limitations, including the potential for sharing resources among the agencies, as appropriate.

   The Implementing Agencies will develop organizational charts that identify staffing needs and who is responsible for what projects and activities and share these at the first quarterly meeting identified in item #1 above. At subsequent quarterly meetings, each agency will discuss any changes to the chart including vacancies and their schedule to fill that vacancy.

4. **Program Management Commitment #4 – Improve Decision Process: Implementing Agencies to discuss internally and report out process improvements at quarterly meetings.**

   Some members of the team noted that there can be a lengthy decision making process and some decisions are revisited multiple times. The team discussed the challenges with five Federal and State agencies having a role in implementing the Settlement along with the roles and challenges of having two groups of external non-Federal Settling Parties, the Third Parties and a Restoration Administrator who also would like input into specific decisions. It was noted that this Revised Framework, with its clear identification of roles and responsibilities, should help address these challenges. Recognizing that there is

always room for improvement, the Agencies committed to continuing to work on improvements through the Program Management Team process and reporting those improvements out to the Settling Parties, Restoration Administrator, and Third Parties at the quarterly meetings noted in item #1 above. It was recognized by the team that improvements should be scalable to fit the importance of the decision. For example, the improvements should consider the importance of the decision and work to focus and spend more time and effort on the more important decisions and less on the less important decisions.

These four commitments include quarterly meetings and reporting. As these commitments are implemented, the frequency of these meetings may be adjusted (more or less frequent), as needed and determined by Reclamation.

The following improvements were discussed but will not be implemented for the reasons described below:

- Federal and State Funding Plan – Some members of the team requested that a separate Federal and State Funding Plan be prepared. However, it was noted that this Revised Framework identifies roles and responsibilities for the Federal and State governments and the corresponding funding needs to complete these efforts. The team felt that the Revised Framework met this need.
- Communicating Funding Support and Challenges to Others – Some members of the team requested a process be identified in the Framework for communicating their support for funding for the Program and challenges with funding to agency management. It was noted that the Settling Parties, Restoration Administrator, and Third Parties have the ability to meet with agency management as they feel is necessary and identifying a plan for funding discussions with agency management should be completed by the non-Federal Settling Parties, Restoration Administrator, and Third Parties outside of the Framework discussions.

2.4 Changes to this Revised Framework

This Framework is a working document and it is expected that some things will change as more information is developed over time or as funding changes over time. This Framework is also necessarily focused on the schedule and budget for construction projects, as these are key drivers to the success of the entire Program. Revisions will be handled based on (1) the resulting impact to the ability of the Agencies to meet the construction projects called for within the specific Five Year Vision and (2) changes in costs that could have implications to the Program's ability to fund all Program actions. More specifically, revisions will be handled as follows:

- Changes that Do Not Impact the Agencies Ability to Meet the Construction Schedules within A Specific Five Year Vision or Impact the Ability to Fund all Program Actions – No revisions to the Framework will be made for changes that do not impact the Agencies' ability to meet the construction schedules within a specific Five Year Vision or for cost changes that do not impact the Agencies' ability to fund all Program actions. These changes could include, but are not limited to, a reduction in funding availability

that reduces the level of effort or results in the cutting of a non-construction project in any one year or for the entire Five Year Vision or an increase in cost of a project that is relatively insignificant as compared to the cost of the other SJRRP actions. These changes will be identified and included in the SJRRP's Annual Work Plan, to the extent that they are known at the time of preparation of the Plan.

- Changes that May, but it is Uncertain if They Impact the Agencies' Ability to Meet the Construction Schedules within A Specific Five Year Vision or Impact the Ability to Fund all Program Actions – It may not always be clear when a change is made if it will impact the Agencies' ability to meet the construction schedules within a specific Five Year Vision or if it will impact the Agencies' ability to fund all SJRRP actions. Therefore, if a change may impact either of these things, the responsible agency will prepare a description of the change, the factors they will work to implement to try to keep the construction project on schedule or costs controlled or reduced and the resulting schedule change if these factors are not successful. This document will be circulated with the Implementing Agencies, Settling Parties, Restoration Administrator, and Third Parties for a two week review and discussion. After the review and incorporation of comments as the responsible agency determines appropriate, the document will be posted on the SJRRP website as an Addendum to the Framework. These changes could include, but are not limited to, the reduction in funding for a construction project in one year that is expected to be made up the following year or cost increases that may be offset by cost savings elsewhere.
- Changes that Will Impact the Agencies' Ability to Meet the Construction Schedules within A Specific Five Year Vision or Impact the Ability to Fund all Program Actions – A revision to the Framework will be made in this circumstance. Reclamation will lead the revision and will coordinate the effort with the Implementing Agencies, Settling Parties, Restoration Administrator, and Third Parties. The revision will address only the specific project or activity that has changed and resulting schedule and cost implications. The revised Framework will be posted to the SJRRP website once completed.

In addition to those circumstances above, at any time, an Implementing Agency, Settling Party, Restoration Administrator, or Third Party can request that Reclamation initiate a revision to the Framework by notifying Reclamation in writing, with a copy to the other parties, of the following: (1) the action or change that warrants a revision; and (2) the suggested revision. The notification shall include all supporting documentation. Within 30 days of receiving the notification, Reclamation will evaluate the request and provide a written response on whether a revision will be made and if so, the process for the revision.

Changes should be discussed, as appropriate, at the quarterly budget and schedule meetings identified under Section 2.3, Tracking Implementation of this Revised Framework.

3.0 Funding Sources and Summary of Costs

A discussion of the SJRRP's funding sources along with the obligations and expenditures to date is provided in this chapter. See Appendix E for a discussion of other possible funding sources and Appendix I for a more detailed accounting of Federal obligations and expenditures for the SJRRP through FY 2014.

3.1 Federal Funding Sources

Paragraph 21 and to some extent, Paragraph 22 of the Settlement includes a funding plan with many of the actions in the plan requiring legislative authorization. As the Settlement Act was developed and finalized, the funding plan for the Settlement changed. The Settlement Act, and specifically, Subtitle A, Part I, is now the "controlling" document for implementing terms of the Settlement. Subtitle A, Part III – Friant Division Improvements, provides authorization for additional projects and activities in addition to those required by the Settlement. Together, these two parts of Public Law 111-11 identify a series of Federal funding sources for implementation of the SJRRP. These sources are described in Section 10009 and Section 10203 of Public Law 111-11 and collectively include the SJRR Fund, Central Valley Project (CVP) Restoration Fund, and new Federal appropriations. A summary of these sources is provided below. In addition to those sources in the Settlement Act, Reclamation also has other authorizations, including the general authorization for Water and Related Resources appropriations. This source is also described below. Table 3-1 provides a summary of the amounts approved (available or authorized and appropriated by Congress) to date from these sources.

Table 3-1. Approved Funds to Date, SJRRP Federal Funding Sources
(values in thousands)

	Prior FYs	FY 10	FY 11	FY 12	FY 13	FY 14	Total
San Joaquin River Restoration Fund	$0	$88,000	$0	$0	$0	$0	**$88,000**
CVP Restoration Fund	$14,500	$1,000	$1,500	$2,000	$2,000	$2,000	**$23,000**
New Federal Appropriations - Section 10009 and 10203 of PL 111-11	$0	$0	$0	$0	$0	$0	**$0**
New Federal Appropriations – Water and Related Resources	$0	$5,000	$5,016	$8,892	$15,530	$26,000	**$60,458**
CalFed	$1,000	$0	$0	$0	$0	$0	**$1,000**
San Joaquin River Restoration Trust Fund	$2,000	$1,000	$1,500	$0	$0	$0	**$4,500**
Total	**$17,500**	**$95,020**	**$8,016**	**$10,892**	**$17,530**	**$28,000**	**$176,958**

Note: Actual receipts. Only $88M of the Friant Surcharge and Recovered Water Account funds can be spent without further appropriation until FY 20. Does not include prior year recovery or carryover of funds from year to year.

3.1.1 San Joaquin River Restoration Fund

Section 10009 of the Settlement Act created the SJRR Fund. Sources of monies deposited into the fund are described below. Table 3-2 identifies collections into the SJRR Fund by source and year. Of the sources into the SJRR Fund identified below, except for the Non-Federal Funds, $88 million was appropriated in the Settlement Act for expenditure. The remainder must either be appropriated by Congress or becomes available for expenditure, not subject to appropriation after October 1, 2019 (in essence, FY 2020).

Table 3-2. Collections into the SJRR Fund to Date

(values in thousands)

	FY 10	FY 11	FY 12	FY 13	FY 14	Total
Friant Capital Repayment	$1,219	$192,500	$22,405	$958	$0	**$217,082**
Friant Surcharge	$10,804	$7,952	$6,358	$4,305	$1,435	**$30,854**
Water and Land Sales	$0	$1,449	$2,016	$480	$2,780	**$6,725**
Non-Federal Funds	$0	$0	$0	$0	$0	**$0**
Total	**$12,023**	**$201,901**	**$30,779**	**$5,743**	**$4,215**	**$254,661**

Note: Actual receipts. Only $88M of the Friant Surcharge and the Water and Land Sales funds can be spent without further appropriation until FY 20. Does not include prior year recovery or carryover of funds from year to year.

Of the sources identified below, both the Friant Surcharge and the Sales of Water and Property continue indefinitely into the future. These monies will accumulate in the SJRR Fund until expended.

Friant Surcharge

Continuation of and the dedication of the "Friant Surcharge," an environmental fee charged pursuant to the Central Valley Project Improvement Act for every acre-foot of water delivered to Friant contractors, except for Recovered Water Account water. Reclamation assumes a long-term average sale of 800,000 AF to the Friant Division. However, actual deliveries and therefore, proceeds will vary substantially by year, as shown in Table 3-2.

Currently, the Friant Surcharge is $7 per acre-foot. Assuming the long-term average sale of 800,000 AF to the Friant Division, this generates a long-term average annual revenue stream of $5.6 million a year. Consistent with Section 10010(d) of the Settlement Act, the surcharge may be reduced from FY 2020 to FY 2039 to offset the financial cost of the conversion from water service contracts to repayment contracts. This reduction would apply to only those contractors that converted their contracts and would be different for each contractor. However, Section 10010(d)(1) of the Settlement Act specifies that the surcharge shall not be reduced below $4 per acre-foot. Section 10010(d)(1) further identifies that, under certain conditions, the Secretary may choose to not reduce the surcharge and instead reduce the contractor's operations and maintenance obligation. This Revised Framework assumes that the surcharge would remain at $7 per acre-foot and, pursuant to Section 10010(d)(1) of the Settlement Act, Reclamation would reduce the contractors' annual operation and maintenance obligation on a dollar-for-dollar basis.

Friant Capital Repayment

The Friant Capital Repayment redirects the capital (construction) component of water rates paid by Friant Division, Hidden Unit, and Buchanan Unit water users to Settlement implementation. Section 10010 of the Settlement Act authorized Reclamation to convert the Friant Division, Hidden Unit, and Buchanan Unit long-term water service contracts into repayment contracts. Reclamation completed this in 2010 and all of the contractors except for four converted their contracts into repayment contracts. As part of this effort, the contractors could choose to repay the capital component of their contract in lump sum or in four installments. All proceeds from the capital component were deposited into the SJRR Fund. In addition, the capital component of the water rates paid by the four contractors that did not convert to repayment contracts is also deposited into the SJRR Fund.

Sales of Water and Property

There are three types of revenues in this category as follows:

- Sale of Recovered Water Account (RWA) water – Paragraph 16(b) of the Settlement directs Reclamation to make water available to all of the Friant Division long-term contractors who are impacted by the SJRRP's Interim and Restoration flows at a total cost of $10 per acre-foot. Water is to be made available only in wet hydrologic conditions. Proceeds from the sale of RWA water is to be deposited into the SJRR Fund. This Revised Framework assumes a long-term average sale of RWA water of 68,000 AF per year, corresponding to long-term average proceeds of $680,000 per year.

- Unreleased Restoration Flows – Under Paragraph 13(i) of the Settlement, and consistent with the conditions of that paragraph, in general, the Secretary can sell the amount of Restoration Flows not released into the San Joaquin River in any year. An analysis was completed as part of the development of this Revised Framework to estimate the potential amount and revenues from the sale of Unreleased Restoration Flows assuming the schedule of projects in this document. This analysis is provided in Appendix G. Based on this analysis and the increasing channel capacity schedule, the Revised Framework assumes $8,194,210 in FY 2016, $7,605,289 per year from FY 2017 through FY 2019, $4,135,474 per year from FY 2020 through FY 2024, and $1,516,204 per year from FY 2025 through FY 2029.

- Sale of Property and Interests in Property – Section 10005 of the Settlement Act authorizes the Secretary to acquire and dispose of property, interests in property, or options to acquire property. Section 10005(c)(3) of the Settlement Act specifies that the proceeds from the sale of property shall be deposited into the SJRR Fund. Some funds are being collected at this time for property rental. However, as Reclamation anticipates eventually using this land for SJRRP purposes, and as Reclamation does not anticipate renting or disposing of much property, the proceeds from this source are assumed to be negligible.

Non-Federal Funds

Non-Federal funds, including State funds, may be deposited into the SJRR Fund. As most State activities on the SJRRP are anticipated to be implemented by the State, as an "in kind service" basis, cash deposits from the State into the SJRR Fund are assumed to be negligible.

3.1.2 CVP Restoration Fund

Section 10009(b)(2) of the Settlement Act authorizes up to $2 million annually, in 2006 price levels, from the CVP Restoration Fund to implement the Settlement. In April 2015 price levels, this is $2.448 million annually. CVP Restoration Funds must be appropriated annually by Congress and are contingent on actual collections from water and power sales.

3.1.3 New Federal Appropriations – Section 10009 and 10203 of PL 111-11

Two new sources of Federal appropriations are provided in Public Law 111-11 as follows:

- Part I, Section 10009(b)(1) of the Settlement Act authorizes new Federal appropriations up to $250 million, in 2006 price levels, for implementing the Settlement. In April 2015 levels, this is $294,376,000. Additionally, the Settlement Act sets a limit on the rate of expenditure of these funds. Section 10009(b)(1) identifies that the Secretary can only expend these funds in an amount equal to the sum of the Friant surcharge, non-Federal contributions, in-kind contributions, and other non-Federal payments actually committed to implementing the Settlement.

- Part III, Section 10203 of Public Law 111-11authorizes an additional $50 million, in 2008 price levels, to carry out certain improvements within the Friant Division, and financial assistance to local agencies for groundwater banking projects. In April 2015 levels, this is $55,023,720. No constraints are provided on the rate of expenditure of these funds.

In addition, in order to implement this Framework, the SJRRP may need additional authorization for appropriations (i.e., to exceed the $250 million dollars authorized in Section 10009(b)(1) of the Settlement Act). If and when the SJRRP may need this additional authorization is unknown at this time and will depend greatly on the amount of New Federal Appropriations – Water and Related Resources (described below) and funding from other potential sources, including but not limited to those in Appendix E.

3.1.4 New Federal Appropriations – Water and Related Resources

In general, the majority of Reclamation's funding is provided in the Water and Related Resources appropriations. These have been the source of all appropriated funds for the SJRRP to date. The future availability of Water and Related Resources appropriations for the SJRRP is unknown at this time as these are subject to annual authorization and appropriation by Congress. However, it is assumed that some, if not a significant amount of funding would be available to the SJRRP through the Water and Related Resources appropriations in the future.

3.1.5 CalFed

Funds in the amount of $1 million were provided through the CalFed appropriation in FY 2009. The SJRRP does not anticipate additional CalFed funding moving forward.

3.1.6 San Joaquin River Restoration Trust Fund

DWR has provided funds via contract to Reclamation to implement certain SJRRP activities. A total of $4.5 million was provided to Reclamation. These funds were provided prior to the authorization of the SJRR Fund and therefore, they were deposited into a trust fund and not into the SJRR Fund. These funds can be used not subject to appropriations.

3.2 State Funding

The State of California has committed to seek multi-benefit projects and funds equaling at least $200 million to support the implementation of the Settlement. State funds are anticipated to come from three different bond sources as described below. Table 3-3 provides a summary of the amounts approved to date from these sources.

Table 3-3. Approved Funds to Date, SJRRP State Funding Sources
(values in thousands)

	Prior FYs	FY 10	FY 11	FY 12	FY 13	FY 14	Total
Department of Water Resources							
Proposition 1E	--	--	--	--	$4,999	--	$4,999
Proposition 13	$2,526	$228	$224	$225			$3,203
Proposition 84	$7,131	$6,759	$7,668	$4,966	$4,134	$7,889	$38,548
Total DWR	$9,657	$6,987	$7,893	$5,191	$9,133	$7,889	$46,749
Department of Fish and Wildlife							
Proposition 1E	--	--	--	--	--	--	--
Proposition 13	$5,000	--	--	--	--	--	$5,000
Proposition 84	$5,483	$2,734	$3,289	$2,792	$15,770	$2,844	$32,912
Total DFW	$10,483	$2,734	$3,289	$2,792	$15,770	$2,844	$37,912
Total State	$20,140	$9,721	$11,182	$7,983	$24,903	$10,733	$84,661
Note: Amounts approved by the legislature to use from the specific bonds.							

- Proposition 1E – The Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1E) authorizes $4.09 billion in to be invested in flood and related water management improvements. The funds are being managed by DWR. $5 million of these funds were allocated to assist the SJRRP in investigating the stability of Lower San Joaquin River Flood Control Project (Flood Control Project) levees.

- Proposition 13 – In March 2000, California voters approved Proposition 13 (2000 Water Bond), which authorizes $1.97 billion to support safe drinking, water quality, flood protection, and water reliability projects throughout the state.

- Proposition 84 – In 2006, California voters approved Proposition 84 that included $100 million in funds to the Natural Resources Agency to be provided to DWR and DFW to support the Settlement. Available funding to still be appropriated and obligated by the State is approximately $21 million (DWR only).

- Proposition 1 – The Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) authorizes $7.545 billion to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection. Of the funds authorized, $475 million will be available to the Natural Resources Agency to support certain projects of the State of

California, one of those projects being the Settlement Agreement to restore the San Joaquin River. The amount of funding that will be made available to support the SJRRP has yet to be defined.

As described elsewhere in the Framework, no additional State funding has been approved. It is anticipated that funds from Proposition 1 will be made available to DFW and DWR to support State activities on the SJRRP. However, further funding will need to be identified for the State to continue to participate in the SJRRP at the levels envisioned in the Framework starting in FY 2018. For purposes of this planning document, it is assumed that additional State funding will be forthcoming and continued participation is assumed.

3.3 Obligations and Expenditures To Date

Table 3-4 provides a summary of the SJRRP obligations and expenditures to date. Additional information on the Federal obligations and expenditures, by funding source and year, is provided in Appendix I. Obligated funds are those that are encumbered for specific activities, such as a contract, plus expended funds. Some obligations can be pulled back or "recovered" if, for example, contracts are cancelled and remaining funds are "deobligated". Expenditures are payments for good or services, or a charge against available funds. These funds are not recoverable.

Table 3-4. SJRRP Obligations and Expenditures

Fund	Obligations (FY 07 to FY 14)	Expenditures (FY 07 to FY 14)
Federal Funding Sources		
SJRR Fund	$71,417,433	$58,640,586
CVP Restoration Fund	$33,002,739	$28,104,904
New Appropriations - Section 10009 and 10203 of PL 111-11	$0	$0
New Appropriations – Water and Related Resources	$59,261,402	$25,423,745
CalFed Funds	$997,822	$997,820
San Joaquin River Restoration Trust Fund	$4,499,134	$3,226,468
Federal Total	**$169,178,530**	**$116,393,523**
Department of Water Resources		
Proposition 1E	$4,998,643	$2,454,121
Proposition 13	$3,202,887	$3,202,887
Proposition 84	$38,547,863	$34,000,243
Department of Fish and Wildlife		
Proposition 1E	--	--
Proposition 13	$3,983,711	$3,680,711
Proposition 84	$16,483,619	$16,463,589
State Total	**$67,216,723**	**$59,801,551**
Total	**$236,395,253**	**$176,195,074**

Federal obligations and expenditures for individual SJRRP projects are provided in Table 3-5. Table 3-5 is based on a series of assumptions as in the early years of the Program, activities were charged to general cost authority numbers. These are all included in the Administration and Program Management activity in the table. This significantly overstates this activity and under states all others. Given the current state of cost tracking, further breakdown for these prior years is not possible. In addition, until FY 2014, the Flow-Related item was a general cost authority covering all aspects of flows management, seepage management, Monitoring and Analysis Plan activities, and to some extent, fish reintroduction. Given the current state of cost tracking, further breakdown for these prior years is not possible. However, a conservative general assumption is that 65 percent of the Flow-Related activity was for seepage actions. Reclamation is completing the establishment of an accounting system to track costs on individual projects identified in this Framework. Quarterly budget and schedule meetings as discussed in Section 2.3 will provide additional budget and schedule information.

Of note in this table is that Seepage Management costs are the SJRRP's single largest cost to date. Approximately $50 million has been obligated to Seepage Management actions and land purchases to address seepage for Third Parties who were not party to the Settlement. This is approximately 30 percent of the total Federal funds obligated as of the end of FY 2014.

Table 3-5. Federal SJRRP Obligations and Expenditures for Individual SJRRP Projects (All Fund Sources)

	Obligated (FY 07 to FY 14)	Expended (FY 07 to FY 14)
Administration & Program Management*	$47,257,114	$40,567,609
Restoration Goal Activities	**$15,686,859**	**$10,753,106**
Mendota Pool Bypass/Reach 2B Improvements	$3,274,690	$3,029,884
Reach 4B/ESB/MB Channel & Structural Improvements	$4,273,294	$1,942,404
Arroyo Canal Fish Screen & Sack Dam Fish Passage	$6,498,145	$4,781,550
Salt & Mud Slough Seasonal Barriers	$98,119	$98,119
Gravel Pit Filing and/or Isolation	$35,405	$35,405
Fisheries Establishment Activities	$1,507,207	$865,745
Flow-Related Activities	**$83,542,150**	**$53,248,450**
Flow-Related Activities (General Cost Authority)	$29,054,813	$21,769,806
Seepage Management	$32,257,441	$9,248,748
Land – Seepage	$17,682,135	$17,682,135
Land - Flowage Easements	$4,547,761	$4,547,761
Water Management Goal and Friant Division Improvement Activities	**$21,024,354**	**$10,175,260**
Paragraph 16 Activities	$6,860,812	$6,025,502
Friant Division Improvements per Part III		
Friant-Kern & Madera Canal Capacity Restoration	$3,883,222	$2,521,179
Reverse Flow Facilities	$276,912	$276,912
Groundwater Banking Projects	$10,003,408	$1,351,667
Other Settlement/Legislation Required Activities 1	$1,602,080	$1,583,126
Viability Study	$55,274	$55,273
Wolfsen v US	$10,699	$10,699
Total	**$169,178,530**	**$116,393,523**

Notes:

This table is based on a series of assumptions as in the early years of the Program, activities were charged to general cost authority numbers. These are all included in the Administration and Program Management activity in the table. This significantly overstates this activity and under states all others. However, there simply is not the detail to break this down further at this time. In addition, until FY 2014, the Flow-Related item was a general cost authority covering all aspects of flows management, seepage management, Monitoring and Analysis Plan activities, and to some extent, fish reintroduction. It is not possible to break these items down further at this time. However, a conservative general assumption is that 65 percent of the Flow-Related activity was for seepage actions.

1. Other Settlement Required Activities was generally the last contract for the PEIS/R, Reclamation's staff time to complete the document and Reclamation's time to modify its water rights at Friant Dam to implement the SJRRP.
2. Viability Study was the Chowchilla Bypass Viability Study.

3.4 Summary of Costs (FY 2015 to FY 2029)

A summary of the estimate costs to implement the SJRRP from FY 2015 to FY 2029, in FY 2015 dollars, is provided in Table 3-6. Implementing Agency costs provided in this Revised Framework are based upon the best available information; however, most costs are based on conceptual or preliminary designs and thus a significant amount of uncertainty exists in the estimates. It is expected that some costs may increase, such as those for the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project, while some costs may decrease, such as those for the levee stability projects. Costs provided in this Revised Framework are not intended to be final and are not intended for funding or decision making purposes. The costs in this Revised Framework are provided for planning purposes and provide a general sense of magnitude of actions.

For this Revised Framework, all construction costs have been indexed to April 2015 price levels. Construction costs generally include a 5 percent mobilization contingency, 15 percent design contingency, and 25 percent construction contingency. Costs are provided for each vision in the respective chapter (Chapters 4, 5, 6, and 7). In addition, a comprehensive cost table is provided in Appendix H. Reclamation's desire is to use local labor to the extent possible, and intends to pursue ways to highly encourage or make one of the selection criteria for construction contractors the use of local labor. However, contracting laws prevent making this a requirement.

This Revised Framework includes Agency costs for actions that are likely not the financial responsibility of the SJRRP. Specifically, responsibility for levee stability costs is currently unknown. In some reaches, the historical operations and maintenance of the channel and levees may have not been completed to the level required in the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project (The Reclamation Board 1967). Although all reaches of the river, except Reach 2B and Reach 4B1, were designed to carry flows sufficient to pass the SJRRP's Restoration Flows when the Flood Control Project was constructed, the current conveyance capacity of these reaches appears to be much less. At this time, it is unclear what agency or organization has responsibility to improve these levees such that full Restoration Flows can be conveyed in the river. This an issue beyond the scope of this Revised Framework that will need to be addressed as the SJRRP moves forward. Recognizing that these actions need to occur to fully implement the Settlement, the costs are included in this Revised Framework. However, the costs of these actions are likely not the responsibility of the SJRRP and these actions should more appropriately be funded outside of the SJRRP. This may also be the case for improvements to the Reach 4B1 channel to allow for flows up to those identified in the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project. For planning purposes, the levee stability costs were designated as a State cost since it is assumed that DWR will continue to lead the work on levee evaluation and improvements if State funds are available.

Table 3-6. SJRRP Project and Activity Costs (in millions)

	2015 Revised (2015 $)
Staffing and Administration	$124[1]
Flow Actions	
Conservation Strategy / Mitigation Measures	$38
Flows	$26[2]
Channel and Structural Improvements	
Mendota Pool Bypass and Reach 2B	$336[3]
Reach 4B, Eastside Bypass and Mariposa Bypass	$274[4]
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$31
Salt and Mud Slough Seasonal Barriers	$6
Passage at Key Barriers	$6
Fish Establishment	
All Other Fish Establishment Actions	$12
Conservation Facility	$26
Water Management Goal & Friant Division Improvements	$96
Total	**$974**
Seepage Projects	$189[5]
Chowchilla Fish Passage	$20
Gravel Pits Filling or Isolation	$14
Miscellaneous	$49
Total Settlement & Friant Division Improvements	**$1,244**
Levee Stability	$307[6]
Total	**$1,551**

Notes:
1 Additional costs include addition of DFW staff costs and reflection of 5 additional years shown on schedule.
2 Does not anticipate costs for related to Unexpected Seepage Losses and reduced monitoring.
3 Excludes Mendota Pool Fish Screen costs as fish entrainment would be an infrequent occurrence. Updated land acquisition costs and operation and maintenance costs, indexed cost estimates to April 2015.
4 Average cost of all Reach 4B alternatives. Framework only considered Eastside Bypass. Updated land acquisition and O&M costs and added Eastside Bypass setback levees, indexed cost estimates to April 2015.
5 Updated land acquisition costs and included operation and maintenance costs.
6 Updated based on hydraulic modeling and slurry wall costs, included staff time. Levee stability costs are likely to decrease.

The Framework only includes estimated Federal operation and maintenance (O&M) costs of facilities and actions that the Secretary determines are needed to implement the Settlement. Nothing in the Settlement or Settlement Act changes the obligation of any long-term water contractor to pay conveyance and conveyance pumping O&M costs to a non-Federal operating entity.

Finally, the State has committed through the Memorandum of Understanding with the Settling Parties, dated September 13, 2006 and various letters from the State, see for example, the November 30, 2006 letter from Secretary Chrisman to Senator Feinstein and the May 5, 2008 letter from Governor Arnold Schwarzenegger to Senator Feinstein to seek multi-benefit projects and funds equaling at least $200 million to support the restoration of the San Joaquin River. In 2006, Proposition 84 provided $100 million in funds to the Natural Resources Agency to be provided to DWR and DFW to support the Settlement. Approximately $21 million in

Proposition 84 funding is still available to DWR to be appropriated and obligated. It is anticipated that funds from Proposition 1 will be made available to DFW and DWR to support State activities on the SJRRP. However, further funding will need to be identified for the State to continue to participate in the SJRRP at the levels envisioned in the Framework starting in FY 2018. For purposes of this planning document, it is assumed that additional State funding will be forthcoming and continued participation is assumed. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding.

3.5 Budget Outlook Summary

Table 3-7 shows the summary of funding needed to implement the SJRRP from Federal and State sources. Funding needs are provided in 2015 dollars. Funding sources identified in the Settlement Act at October 2006 or October 2008 price levels have been brought to April 2015 price levels. See Appendix H for an annual accounting of funding needs and anticipated sources.

In summary, the Federal funding need is estimated to be $1,106,913,000. Of this amount, $777,869,000 has been identified through existing sources. This leaves a deficit of $329,044,000. Seepage management was not originally anticipated in the Settlement and the magnitude and complexity of seepage management was not anticipated in the Settlement Act and thus the Settlement Act did not provide any funds for this estimated $189 million cost. The other $140 million of the Federal deficit anticipated is due to increases in land acquisition costs, Phase 1 project cost increases, indexing of construction projects to 2015 dollars, and increased costs due to the necessary extension of the SJRRP's implementation over time.

The funding need designated as a State cost is $137,277,000. In addition to this amount, an estimated $307 million is for levee stability costs that were not originally anticipated when the Settlement was signed, and may not ultimately be the financial responsibility of the SJRRP (see Section 3.4). Levee stability costs, estimated to be $307 million, are conservative and are expected to decrease significantly based on geotechnical analysis on the levees currently underway by DWR. Including levee stability costs, the total funding need designated as a State cost is $443,954,000.

Table 3-7. SJRRP Funding Needs and Sources (FY 2015 to FY 2029, in thousands)

	Funds in 2015 Dollars
Funding Needs Remaining	
Total Estimated Federal Funding Need	$1,106,913
Total Estimated State Funding Need	$137,277
Total Estimated State Funding Need with Levee Stability [1]	$443,954
Funding Sources Remaining	
SJRR Fund [2]	$356,730
CVP Restoration Fund ($2,448 annual)	$36,724
New Federal Appropriations – Section 10009 of PL 111-11	$294,377
New Federal Appropriations – Section 10203 of PL 111-11	$55,024
New Federal Appropriations – Water and Related Resources	35,014
State Authorized Funding Remaining	$50,900
Total Estimated Remaining Funding Sources	*$777,869*
Anticipated Shortfall in Federal Funding	***$329,044***
Anticipated Shortfall in State Funding	***$86,377***
Anticipated Non-SJRRP State Funding Needs	***$306,677***
Anticipated Shortfall in State Funding with Levee Stability	***$393,054***

Note: 1. The responsible agency for levee stability costs has not been determined; however, it is assumed that DWR would continue to lead levee evaluations and improvements if State funds are available. Levee stability costs are expected to decrease.

2. Includes estimated future Unreleased Restoration Flows sales, RWA sales, and Friant surcharge collections.

3. Includes FY 2015 appropriations. Additional appropriations in the future are likely but amounts are unknown at this time and therefore, not included in this table.

4.0 Five Year Vision (FY 2015 to 2019): At Least 1,300 cfs Capacity in All Reaches

This chapter describes the Five Year Vision for the Framework, which begins in FY 2015, October 1, 2014, and ends in FY 2019, September 30, 2019. The main focus of the Five Year Vision is to achieve at least 1,300 cfs capacity in all reaches of the San Joaquin River and to complete the Friant-Kern Canal and Madera Canal Capacity Restoration projects. Specifically, the goals are:

1. Provide at least 1,300 cfs capacity in all reaches of the San Joaquin River and fish passage over major barriers to migration such that both adult and juvenile salmon can complete their migration routes without human assistance at the end of the five years.

2. Complete construction of the Friant-Kern Canal and Madera Canal Capacity Restoration projects.

3. Continue to implement Water Management Goal Actions to reduce or avoid water supply impacts to the Friant Division long-term contractors.

Specific actions that the Implementing Agencies intend to undertake to achieve these goals are listed below and described in more detail in the following sections:

- Program Staffing
  - Continue Program Management and Administration actions for all agencies
- Flow Actions
  - Implement the Conservation Strategy and flow-related mitigation measures and environmental commitments from the PEIS/R ROD
  - Implement flow management and monitoring
  - Complete seepage and levee stability to allow for flows up to the Reach 2B capacity (at least 1,300 cfs) in the river
- Channel and Structural Improvements
  - Construct key components of the Mendota Pool Bypass or Fresno Slough Dam
  - Complete the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements EIS/R and associated Report to Congress
  - Complete final design and any additional permitting actions for the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project
  - Provide passage, if determined necessary, for anadromous salmonids at key barriers to migration
- Fish Establishment
  - Complete construction of the Salmon Conservation and Research Facility and water supply

  - Continue to operate and maintain the Interim and permanent Conservation Facility
  - Complete annual spring-run donor stock collection and tagging, including the collection of wild stock
  - Complete annual trap and haul of adult Chinook salmon until Mendota Pool Bypass is completed
  - Continue salmon genetics monitoring
  - Implement spring-run and fall-run segregation actions, if determined necessary
  - Complete permit application and issue permit for the use of wild stock
- Continue implementing the Water Management Goal and Friant Division Improvements
  - Continue Water Management Goal support actions including recapture and recirculation of Restoration Flows, tracking Recovered Water Account (RWA) balances, and allocating RWA water
  - Complete Recapture and Recirculation Plan
  - Complete Recirculation EIS
  - Complete construction of the Friant-Kern Canal and Madera Canal Capacity Restoration projects
  - Continue managing FY 2013 awards for Part III funds

4.1 Schedule, Funding Needs and Funding Outlook

4.1.1 Schedule and Funding Need

Table 4-1 provides a summary of the schedule of the specific actions to be undertaken as part of the Five Year Vision. Table 4-2a provides a summary of the costs and associated funding need for these actions by year. Tables 4-2b and 4-2c break down the Federal and State, respectively, costs and funding needs for the Five Year Vision. All costs are provided in 2015 dollars. Activities and cost will vary from year to year and the goal is to complete all activities within the Five Year Vision. All State costs are for planning purposes only and do not signify a responsibility of the State to fund these activities. Participation of the State will be dependent on available funds, State mandates, and the ability of the State to support the priority actions of the SJRRP with its resources. A larger portion of the State costs are for levee stability and levee stability costs are expected to decrease.

Table 4-1. Schedule of Actions for the Five Year Vision

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Flow-Related Activities					
Conservation Strategy and Flow-related Mitigation Measures					
Conservation Strategy					
Invasive Species Control	P	P	P	P	P
Vegetation Monitoring and Other			P	P	P
Re-consultation on Flows				P	
Implement Conservation Strategy Actions for Flows					
Channel Capacity Advisory Group (Includes Erosion Monitoring)	P	P	P	P	P
Physical Monitoring and Management Plan Implementation					
Steelhead Monitoring	P	P	P	P	P
Programmatic Cultural Resources Consultation	P	P	P		
Millerton Lake Boat Ramps	P		C		
Traffic Detour Planning	P	P			
Sand Slough / Eastside Bypass Sand Removal	D	C			
Flow Management and Monitoring					
Daily Flow Management and Monitoring	P	P	P	P	P
Stream Gaging	P	P	P	P	P
Unexpected Seepage Losses					
Unreleased Restoration Flows	P	P	P	P	P
Restoration Flow Guidelines	P			P	
Data Management	P	P	P	P	P
MAP Actions to Inform Flow Decisions	P	P	P	P	P
Water Right Annual Report	P	P	P	P	P
Seepage Actions	C	C	C	C	C
Levee Stability Actions	P	P	D	D	C
Restoration Goal Activities					
Phase I Projects					
Mendota Pool Bypass	D	D	D	C	C
Reach 2B and Chowchilla Bypass Structure Improvements					
Reach 4B/ESB/MB Channel and Structural Improvements	P	P	P	P	P
Arroyo Canal Fish Screen and Sack Dam Fish Passage					
Salt and Mud Slough Seasonal Barriers					
Passage at Key Barriers to Migration	P	D	D	C	C
Phase II Projects					
Reach 4B/ESB High Flow Routing					
Chowchilla Bifurcation Structure Fish Passage					
Gravel Pit Filing and/or Isolation	P	P	P	P	P
Fisheries Re-introduction Activities					
Conservation Facility Construction (DFW cost)			C		
Conservation Facility Water Supply Line (Reclamation cost)	D	D	C		
Conservation Facility Operations and Maintenance	O&M	O&M	O&M	O&M	O&M
Donor Stock Collection	P	P	P	P	P
Trap and Haul (short-term and as needed)	P	P	P	P	P
Genetics Monitoring	P	P	P	P	P
Segregation Actions	P	P	P	P	P
Paragraph 12 Activities					
Water Management Goal and Friant Division Improvement Activities					
Water Management Goal Oversight	P	P	P	P	P
Recapture and Recirculation Activities	P	P	P	P	P
Friant-Kern and Madera Canal Capacity Restoration	C	C	O&M	O&M	O&M
Reverse Flow Facilities	P		P	P	P
Financial Assistance for Groundwater Banking Projects	P	P	P		

Notes: Cell left blank = No planned activity
P = Planning, Formulation, Environmental Compliance, Studies C = Construction
D = Design Efforts, including Final Design, Data Collection, Land Acquisition O&M = Operations and Maintenance

Table 4-2a. Summary of Costs for the Five Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Administration and Program Management	**$8,148**	**$8,258**	**$8,258**	**$8,258**	**$8,258**
Reclamation[1]	$1,832	$1,832	$1,832	$1,832	$1,832
USFWS[2]	$1,621	$1,702	$1,702	$1,702	$1,702
NMFS[3]	$971	$1,000	$1,000	$1,000	$1,000
DWR	$924	$924	$924	$924	$924
DFW	$2,800	$2,800	$2,800	$2,800	$2,800
Flow-Related Activities	**$22,797**	**$22,879**	**$17,161**	**$17,641**	**$25,076**
Conservation Strategy and Flow-related Mitigation Measures	***$2,218***	***$2,838***	***$2,528***	***$2,818***	***$1,308***
Conservation Strategy					
Invasive Species Control	$300	$300	$300	$300	$300
Vegetation Monitoring & Other	$0	$0	$200	$200	$200
Re-consultation on Flows	$0	$0	$0	$1,500	$0
Implement Conservation Strategy Actions for Flows	$0	$0	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$290	$800	$600	$590	$580
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$228	$228	$228	$228	$228
Programmatic Cultural Resources Consultation	$100	$1,500	$1,000	$0	$0
Millerton Lake Boat Ramps	$50	$0	$200	$0	$0
Traffic Detour Planning	$50	$10	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$1,200	$0	$0	$0	$0
Flow Management and Monitoring	***$1,815***	***$1,697***	***$1,521***	***$1,533***	***$1,389***
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77
Stream Gaging	$189	$189	$288	$189	$189
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$36	$36	$36	$36	$36
Restoration Flow Guidelines	$126	$0	$0	$126	$0
Data Management	$250	$258	$133	$68	$50
MAP Actions to Inform Flow Decisions	$1,100	$1,100	$950	$1,000	$1,000
Water Right Annual Report	$37	$37	$37	$37	$37
Seepage Actions	***$15,574***	***$15,805***	***$7,650***	***$10,867***	***$11,369***
Levee Stability Actions (not a SJRRP cost)	***$3,190***	***$2,539***	***$5,462***	***$2,423***	***$11,010***
Restoration Goal Activities	**$5,056**	**$20,280**	**$56,891**	**$32,019**	**$33,249**
Phase I Projects[4]	***$2,724***	***$15,779***	***$39,333***	***$28,937***	***$29,617***
Mendota Pool Bypass	$2,320	$15,037	$38,043	$28,747	$29,427
Reach 2B Improvements	$0	$0	$0	$0	$0
Reach 4B/ESB/MB Channel and Structural Improvements	$190	$215	$290	$190	$190
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$214	$527	$1,000	$0	$0
Salt and Mud Slough Seasonal Barriers	$0	$0	$0	$0	$0
Passage at Key Barriers to Migration	***$300***	***$1,750***	***$500***	***$1,060***	***$1,610***
Phase II Projects	***$200***	***$330***	***$280***	***$250***	***$250***

Table 4-2a. Summary of Costs for the Five Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Reach 4B/ESB High Flow Routing	$0	$0	$0	$0	$0
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$200	$330	$280	$250	$250
Fisheries Re-introduction Activities	***$1,832***	***$2,421***	***$16,778***	***$1,772***	***$1,772***
Conservation Facility Construction (DFW cost)	$0	$0	$13,167	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$50	$650	$1,800	$0	$0
Conservation Facility Operations and Maintenance	$700	$700	$700	$700	$700
Donor Stock Collection	$80	$80	$80	$80	$80
Trap and Haul (short-term and as needed)	$592	$592	$592	$592	$592
Genetics Monitoring	$210	$199	$239	$200	$200
Segregation Actions	$200	$200	$200	$200	$200
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$19,830**	**$15,530**	**$2,810**	**$1,850**	**$1,750**
Water Management Goal Oversight[5]	$1,200	$1,200	$1,200	$1,200	$1,200
Recapture and Recirculation Activities	$500	$500	$500	$500	$500
Friant-Kern and Madera Canal Capacity Restoration[6]	$15,080	$13,820	$100	$0	$0
Reverse Flow Facilities[7]	$250	$0	$1,000	$150	$50
Financial Assistance for Groundwater Banking Projects	$2,800	$10	$10	$0	$0
Miscellaneous and/or Opportunistic Actions	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**
Total Estimated SJRRP Funding Need	**$55,141**	**$66,908**	**$82,158**	**$59,845**	**$59,823**
Levee Stability	**$3,190**	**$2,539**	**$5,462**	**$2,423**	**$11,010**
Total Estimated Funding Need	**$58,331**	**$69,447**	**$87,620**	**$62,268**	**$70,833**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.
6. Assumes that the Canal Capacity Correction Project is obligated in FY 2014, FY 2015, and FY 2016, but construction may occur over time depending on the construction season and canal deliveries.
7. Reverse flow facilities are not included as part of the Core Program in the 2012 Framework. These costs are for the feasibility study only.

Table 4-2b. Federal Costs for the Five Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Administration and Program Management	**$4,424**	**$4,534**	**$4,534**	**$4,534**	**$4,534**
Reclamation[1]	$1,832	$1,832	$1,832	$1,832	$1,832
USFWS[2]	$1,621	$1,702	$1,702	$1,702	$1,702
NMFS[3]	$971	$1,000	$1,000	$1,000	$1,000
DWR	$0	$0	$0	$0	$0
DFW	$0	$0	$0	$0	$0
Flow-Related Activities	**$18,997**	**$19,220**	**$10,929**	**$14,408**	**$13,266**
Conservation Strategy and Flow-related Mitigation Measures	***$2,028***	***$2,138***	***$2,028***	***$2,328***	***$828***
Conservation Strategy					
Invasive Species Control	$300	$300	$300	$300	$300
Vegetation Monitoring & Other	$0	$0	$200	$200	$200
Re-consultation on Flows	$0	$0	$0	$1,500	$0
Implement Conservation Strategy Actions for Flows	$0	$0	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$100	$100	$100	$100	$100
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$228	$228	$228	$228	$228
Programmatic Cultural Resources Consultation	$100	$1,500	$1,000	$0	$0
Millerton Lake Boat Ramps	$50	$0	$200	$0	$0
Traffic Detour Planning	$50	$10	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$1,200	$0	$0	$0	$0
Flow Management and Monitoring	***$1,395***	***$1,277***	***$1,251***	***$1,213***	***$1,069***
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77
Stream Gaging	$119	$119	$218	$119	$119
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$36	$36	$36	$36	$36
Restoration Flow Guidelines	$126	$0	$0	$126	$0
Data Management	$250	$258	$133	$68	$50
MAP Actions to Inform Flow Decisions	$750	$750	$750	$750	$750
Water Right Annual Report	$37	$37	$37	$37	$37
Seepage Actions	***$15,574***	***$15,805***	***$7,650***	***$10,867***	***$11,369***
Levee Stability Actions (not a SJRRP cost)	***$0***	***$0***	***$0***	***$0***	***$0***
Restoration Goal Activities	**$4,546**	**$19,340**	**$42,884**	**$30,649**	**$31,329**
Phase I Projects[4]	***$2,664***	***$15,719***	***$39,273***	***$28,877***	***$29,557***
Mendota Pool Bypass	$2,300	$15,017	$38,023	$28,727	$29,407
Reach 2B Improvements	$0				
Reach 4B/ESB/MB Channel and Structural Improvements	$150	$175	$250	$150	$150
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$214	$527	$1,000	$0	$0
Salt and Mud Slough Seasonal Barriers	$0	$0	$0	$0	$0
Passage at Key Barriers to Migration	***$50***	***$1,200***	**$0**	**$0**	**$0**

Table 4-2b. Federal Costs for the Five Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Phase II Projects	***$0***	***$0***	***$0***	***$0***	***$0***
Reach 4B/ESB High Flow Routing	$0	$0	$0	$0	$0
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$0	$0	$0	$0	$0
Fisheries Re-introduction Activities	***$1,832***	***$2,421***	***$3,611***	***$1,772***	***$1,772***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$50	$650	$1,800	$0	$0
Conservation Facility Operations and Maintenance	$700	$700	$700	$700	$700
Donor Stock Collection	$80	$80	$80	$80	$80
Trap and Haul (short-term and as needed)	$592	$592	$592	$592	$592
Genetics Monitoring	$210	$199	$239	$200	$200
Segregation Actions	$200	$200	$200	$200	$200
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$19,830**	**$15,530**	**$2,810**	**$1,850**	**$1,750**
Water Management Goal Oversight[5]	$1,200	$1,200	$1,200	$1,200	$1,200
Recapture and Recirculation Activities	$500	$500	$500	$500	$500
Friant-Kern and Madera Canal Capacity Restoration[6]	$15,080	$13,820	$100		
Reverse Flow Facilities[7]	$250		$1,000	$150	$50
Financial Assistance for Groundwater Banking Projects	$2,800	$10	$10		
Miscellaneous and/or Opportunistic Actions	**$2,000**	**$2,000**	**$2,000**	**$2,000**	**$2,000**
Total Estimated Federal Funding Need	**$49,797**	**$60,624**	**$63,157**	**$53,441**	**$52,879**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation. Costs after FY 2017 held steady.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.
6. Assumes that the Canal Capacity Correction Project is obligated in FY 2014, FY 2015, and FY 2016, but construction may occur over time depending on the construction season and canal deliveries.
7. Reverse flow facilities are not included as part of the Core Program in the 2012 Framework. These costs are for the feasibility study only.

Table 4-2c. State Costs for the Five Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Administration and Program Management	**$3,724**	**$3,724**	**$3,724**	**$3,724**	**$3,724**
Reclamation[1]	$0	$0	$0	$0	$0
USFWS[2]	$0	$0	$0	$0	$0
NMFS[3]	$0	$0	$0	$0	$0
DWR	$924	$924	$924	$924	$924
DFW	$2,800	$2,800	$2,800	$2,800	$2,800
Flow-Related Activities	**$3,800**	**$3,659**	**$6,232**	**$3,233**	**$11,810**
Conservation Strategy and Flow-related Mitigation Measures	***$190***	***$700***	***$500***	***$490***	***$480***
Conservation Strategy	$0	$0	$0	$0	$0
Invasive Species Control	$0	$0	$0	$0	$0
Vegetation Monitoring & Other	$0	$0	$0	$0	$0
Re-consultation on Flows	$0	$0	$0	$0	$0
Implement Conservation Strategy Actions for Flows	$0	$0	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$190	$700	$500	$490	$480
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$0	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$420***	***$420***	***$270***	***$320***	***$320***
Daily Flow Management and Monitoring	$0	$0	$0	$0	$0
Stream Gaging	$70	$70	$70	$70	$70
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$0	$0	$0	$0	$0
Restoration Flow Guidelines	$0	$0	$0	$0	$0
Data Management	$0	$0	$0	$0	$0
MAP Actions to Inform Flow Decisions	$350	$350	$200	$250	$250
Water Right Annual Report	$0	$0	$0	$0	$0
Seepage Actions	$0	$0	$0	$0	$0
Levee Stability Actions	***$3,190***	***$2,539***	***$5,462***	***$2,423***	***$11,010***
Restoration Goal Activities	**$510**	**$940**	**$14,007**	**$1,370**	**$1,920**
Phase I Projects[4]	***$60***	***$60***	***$60***	***$60***	***$60***
Mendota Pool Bypass	$20	$20	$20	$20	$20
Reach 2B Improvements	$0	$0	$0	$0	$0
Reach 4B/ESB/MB Channel and Structural Improvements	$40	$40	$40	$40	$40
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$0	$0	$0	$0	$0
Salt and Mud Slough Seasonal Barriers	$0	$0	$0	$0	$0
Passage at Key Barriers to Migration	***$250***	***$550***	***$500***	***$1,060***	***$1,610***

Table 4-2c. State Costs for the Five Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 15	FY 16	FY 17	FY 18	FY 19
Phase II Projects	***$200***	***$330***	***$280***	***$250***	***$250***
Reach 4B/ESB High Flow Routing	$0	$0	$0	$0	$0
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$200	$330	$280	$250	$250
Fisheries Re-introduction Activities	***$0***	***$0***	***$13,167***	***$0***	***$0***
Conservation Facility Construction (DFW cost)	$0	$0	$13,167	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$0	$0	$0	$0	$0
Donor Stock Collection	$0	$0	$0	$0	$0
Trap and Haul (short-term and as needed)	$0	$0	$0	$0	$0
Genetics Monitoring	$0	$0	$0	$0	$0
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities[9]	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$0**	**$0**	**$0**	**$0**	**$0**
Water Management Goal Oversight[5]	$0	$0	$0	$0	$0
Recapture and Recirculation Activities	$0	$0	$0	$0	$0
Friant-Kern and Madera Canal Capacity Restoration[6]	$0	$0	$0	$0	$0
Reverse Flow Facilities[7]	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$0	$0	$0	$0	$0
Miscellaneous and/or Opportunistic Actions	**$500**	**$500**	**$500**	**$500**	**$500**
Total Estimated State Funding Need	**$8,534**	**$8,823**	**$24,463**	**$8,827**	**$17,954**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.
6. Assumes that the Canal Capacity Correction Project is obligated in FY 2014, FY 2015, and FY 2016, but construction may occur over time depending on the construction season and canal deliveries.
7. Reverse flow facilities are not included as part of the Core Program in the 2012 Framework. These costs are for the feasibility study only.

4.1.2 Funding Outlook

From the Federal perspective, the SJRRP will be almost entirely reliant on Federal appropriations during the Five Year Vision. While $88 million is available from the SJRR Fund not subject to appropriations, and $52 million is available from the SJRR Fund by separate authority for implementation of the Friant-Kern and Madera Canal Capacity Restoration projects and the Friant-Kern Canal Reverse Pump-back Project, Reclamation anticipates fully obligating these funds by FY 2017. Accordingly, the Five Year Vision assumes annual Federal appropriations ranging from $34 to $53 million, including $2.445 million per year in funds from the CVP Restoration Fund ($2 million indexed to 2015 dollars). Overall, the SJRRP will be funding constrained and activities will be subject to the amount of appropriated funds.

The State has committed to seek multi-benefit projects and funds equaling at least $200 million to support restoration of the San Joaquin River. In 2006, Proposition 84 provided $100 million in funds to the Natural Resources Agency to be provided to DWR and DFW to support the Settlement. Approximately $21 million in Proposition 84 funding is still available to DWR to be appropriated and obligated. It is anticipated that funds from Proposition 1 will be made available to DFW and DWR to support State activities on the SJRRP. For purposes of this planning document, it is assumed that additional State funding will be forthcoming and continued participation is assumed for the entire Five Year Vision. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding.

4.2 Responsible Implementing Agency

Table 4-3 provides a summary of the Implementing Agencies responsible for carrying out the activities in the Five Year Vision.

Table 4-3. Implementing Agency Leads in the Five Year Vision

Action	Lead Implementing Agency
Program Staffing	
Federal Agencies	Reclamation will continue to provide funding for Reclamation, USFWS, and NMFS program staffing functions. However, it is expected the USFWS and NMFS consider ways to fund these activities with their own funds.
State Agencies	The State agencies will continue to provide funding for their program staffing functions.
Flow Actions	
Conservation Strategy and Flow-related Mitigation Measures	
Conservation Strategy - Invasive Species Control	Reclamation
Conservation Strategy – Re-consultation on Flows	Reclamation, with technical assistance from NMFS and USFWS
Channel Capacity Advisory Group (includes Erosion Monitoring)	Reclamation, with technical assistance from DWR (at DWR's own cost)
Physical Monitoring and Management Plan	Reclamation, with technical assistance from DWR (at DWR's own cost)
Steelhead Monitoring	Reclamation
Cultural Resources	Reclamation
Boat Launch Ramps	Reclamation
Traffic Detour Planning	Reclamation

Table 4-3. Implementing Agency Leads in the Five Year Vision

Action	Lead Implementing Agency
Flow Management and Monitoring	
Daily Flow Management and Monitoring	Reclamation
Stream Gaging	Reclamation and DWR
Unexpected Seepage Losses	Reclamation
Unreleased Restoration Flows	Reclamation
Restoration Flow Guidelines	Reclamation
Data Management	Reclamation
Monitoring and Analysis Plan Actions to Inform Flow Decisions	Reclamation, DWR, and DFW
Water Right Compliance and Annual Report	Reclamation
Seepage, Levee Stability, and Flowage Easement	
Seepage	Reclamation
Levee Stability	DWR
Flowage Easements	Reclamation
Channel and Structural Improvements	
Mendota Pool Bypass construction	Reclamation
Reach 4B EIS and Report to Congress	Reclamation and DWR (each agency cover their own staff costs and will share in design costs)
Arroyo Canal Fish Screen and Sack Dam Fish Passage Project re-design and permitting	Reclamation
Passage at Key Barriers	Sack Dam and Merced National Wildlife Refuge Weir Reoperation – Reclamation Dan McNamara Road, Eastside Bypass Rock Weir, and Eastside Bypass Control Structure – DWR and DFW
Fish Establishment	
Salmon Conservation and Research Facility Construction	DFW for facility; Reclamation for the water supply line to end of Federal property at Friant Dam
Operation of the Interim and Conservation Facility	DFW will operate with funding provided by Reclamation
Spring-run Donor Stock Collection	USFWS and DFW
Trap and Haul of Adult Salmon	Reclamation
Genetics Monitoring	Reclamation and DFW
Segregation Actions	USFWS
Complete Permit Application and Make Permitting Decision for use of Wild Spring-run Stocks	USFWS for permit application and NMFS for permit processing
Complete Permit Application and Make Permitting Decision for Continuation of Broodstock and Direct Release Efforts	USFWS for permit application and NMFS for permit processing
Issue Annual Technical Memorandum pursuant to 10(j) and 4(d) Rule Package	NMFS
Water Management Goal and Friant Division Improvement Actions	
Recapture, Recirculation and Tracking / Allocating RWA water	Reclamation
Recapture and Recirculation Plan	Reclamation
Recirculation EIS	Reclamation
Friant-Kern Canal and Madera Canal Capacity Restoration projects	Reclamation
Manage Part III Funds and Projects	Reclamation

4.3 Program Staffing and Administration

Program staffing and administration includes a wide range of activities, including funding for Reclamation, USFWS, and NMFS program wide-related activities and administration and program-wide public and landowner outreach.

For Reclamation, costs include staff time for program-wide actions, office supplies and office space, training, overhead and administrative actions (time not spent on specific SJRRP projects), and program-wide public outreach and landowner outreach activities. In general, within Reclamation, if the cost is a result of a specific SJRRP project, it is charged to the project. This activity covers the overall general program staffing and administrative activities and costs that are not attributable to a specific SJRRP project. This effort also includes development and implementation of a recreational outreach program as identified in Mitigation Measure REC-12 of the PEIS/R ROD.

For USFWS and NMFS, costs include all staff time and activities other than those for specific Monitoring and Analysis Plan (MAP) studies. At this time, USFWS and NMFS do not break down their costs by SJRRP project action.

For DWR, costs include such things as staff time for program-wide actions, training, overhead, supervising, and administrative work activities. In general, within DWR, if the cost is a result of specific technical work on a SJRRP project, it is charged to the project; otherwise, it is included in this activity. The State also provides financial support to the Restoration Administrator and the Technical Advisory Committee, which is included in these costs.

The estimated costs for staffing and administration for the Five Year Vision (FY 2015 to 2019) are provided in Table 4-4. Staffing and administration is an ongoing annual activity and the costs are reflective of this.

Table 4-4. Estimated Program Staffing and Administration Costs for the Five Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Reclamation	$1,832	$1,832	$1,832	$1,832	$1,832	$9,160
USFWS[1]	$1,621	$1,702	$1,702	$1,702	$1,702	$8,429
NMFS[2]	$971	$1,000	$1,000	$1,000	$1,000	$4,971
DWR	$924	$924	$924	$924	$924	$4,620
DFW	$2,800	$2,800	$2,800	$2,800	$2,800	$14,000
Total	$8,148	$8,258	$8,258	$8,258	$8,258	$41,180

Notes: Reclamation covers the cost for Reclamation, USFWS, and NMFS program staffing and administration costs. DWR and DFW cover their costs for program staffing and administration.

1. FY 2015 and 2016 based on Interagency Agreement between USFWS and Reclamation.
2. FY 2015 to 2017 based on Interagency Agreement between NMFS and Reclamation.

4.4 Flow Actions

Flow-related actions include management and monitoring of physical and biological processes that are necessary to successfully implement Paragraph 13 of the Settlement. This includes the following actions:

- Implementation of the flow-related actions or "Project-level" actions in the Conservation Strategy and the flow-related mitigation measures and environmental commitments in the PEIS/R ROD;

- Flow management and monitoring, including MAP actions to help inform flow decisions; and,

- Addressing the seepage and levee stability commitments made in the PEIS/R ROD to allow for flows up to the Reach 2B channel capacity in the river. Currently, Reach 2B channel capacity is estimated at 1,120 cfs. Previously it was estimated at 1,300 cfs, and occasionally sees more than 1,120 cfs in flood flows. Therefore, actions are being taken in other reaches to increase capacity to at least 1,300 cfs in case the Reach 2B channel capacity changes.

The flow-related actions that are expected to occur in the Five Year Vision (FY 2015 to 2019) are described below.

4.4.1 Conservation Strategy and Flow-related Mitigation Measures

Conservation strategy and flow-related mitigation measures and environmental commitments include the actions and commitments identified in the PEIS/R ROD related to flows. Specifically, within the Five Year Vision (FY 2015 to 2019), this includes the following:

- Conservation Strategy – As part of the PEIS/R ROD, a comprehensive strategy for the conservation of listed and sensitive species and habitats was prepared, and will be implemented in coordination with USFWS, NMFS, and DFW. The strategy's purpose is to minimize and avoid potential impacts to sensitive species and habitats from the implementation of the Settlement. This action incudes implementation of the "project-level" actions within the Conservation Strategy. Specifically, within the Five Year Vision the following project-level action are anticipated:

    - Invasive Species Control – Conservation Measure INV-1 includes the implementation of the Invasive Vegetation Monitoring and Management Plan for the SJRRP (Appendix L of the Draft PEIS/R), which includes measures to monitor, control, and where possible eradicate, invasive plant infestations during flow releases.

    - Vegetation Monitoring and Other – Conservation Measure RHSNC-1 requires development and implementation of the Riparian Habitat Mitigation and Monitoring Plan. The draft Riparian Habitat Mitigation and Monitoring Plan requires updating of the riparian habitat map every 2-5 years. In addition, the Physical Monitoring and Management Plan requires routine transect monitoring following peak flow events.

- Re-consultation on Flows – Consistent with the Biological Opinions issued by NMFS and USFWS, Restoration Flow releases of up to 1,660 cfs at Friant Dam and a corresponding flow of up to 1,300 cfs in Reach 5 would not result in adverse impacts to species or their habitats. In preparation for Restoration Flow releases to exceed 1,660 cfs from Friant Dam and/or 1,300 cfs in Reach 5 in the Ten Year Vision, this Five Year Vision includes re-consulting on flows.

- Channel Capacity Advisory Group – The PEIS/R ROD included a commitment to establish a Channel Capacity Advisory Group to provide independent review of estimated then-existing channel capacities, monitoring results, and management actions to address vegetation and sediment transport within the system as identified by Reclamation. Reclamations costs include assistance with preparing a draft and final Channel Capacity Report each year and facilitation of the Group. Actual actions to improve channel capacity are identified under the Section 4.4.3, Seepage and Levee Stability, and Section 4.5, Channel and Structural Improvements.

  This action also includes the erosion monitoring commitment in the PEIS/R ROD. The PEIS/R ROD included a commitment to implement erosion monitoring and management, including monitoring potential erosion sites, reducing Interim and Restoration flows as necessary, and reporting ongoing results of monitoring and management actions to the Channel Capacity Advisory Group.

  The State cost below includes aerial photos, photo evaluations, and surveys of problem areas for erosion. Capacity monitoring, also a State cost, includes subsidence surveys, sediment surveys, and topographic surveys. State costs also include report preparation.

- Physical Monitoring and Management Plan – The PEIS/R ROD includes a commitment to implement a Physical Monitoring and Management Plan. The Physical Monitoring and Management Plan provides guidelines for observing and adjusting to changes in physical conditions within the Restoration Area. The Physical Monitoring and Management Plan consists of five component plans, addressing interrelated physical conditions including flow, groundwater seepage, channel capacity, propagation of native vegetation, and suitability of spawning gravel. Each component plan identifies objectives for the physical conditions within the Restoration Area, and provides guidelines for the monitoring and management of those conditions. The flow monitoring component is addressed in Section 4.4.2, Flow Management and Monitoring. The groundwater seepage component is address in Section 4.4.3, Seepage and Levee Stability. The channel capacity component is addressed in the bullet above and in Section 4.4.3, Seepage and Levee Stability. The native vegetation component would be implemented in future years as channel capacities increase over time and in the event that additional riparian vegetation is needed beyond that provided from the Riparian Recruitment Flows called for in the Settlement. The spawning gravel component would be implemented in future years as additional salmon return to the system and in the event that monitoring determines there is insufficient spawning gravel. Therefore, no actions are included in the Five Year Vision to implement the Physical Monitoring and Management Plan.

- Steelhead Monitoring – Environmental Commitment EC-9 of the PEIS/R ROD includes implementation of steelhead monitoring actions. Specifically, when SJRRP Interim and Restoration flows connect the upper San Joaquin River to the lower San Joaquin River, below the Merced River, Reclamation will continue to implement the Steelhead Monitoring Plan. The Steelhead Monitoring Plan will be implemented from the time the Hills Ferry Barrier is removed each year (approximately December 1) through March 15, as needed and in coordination with NMFS.

- Cultural Resources – Mitigation Measure CUL-2 in the PEIS/R ROD includes compliance with the Federal National Historic Preservation Act Section 106 process to mitigate any significant, adverse impacts to cultural resources and historic properties to less than significant levels. Reclamation is in the process of developing a Programmatic Agreement with the State Historic Preservation Officer through the Section 106 consultation process. The Five Year Vision assumes that Reclamation will complete the Programmatic Agreement process and begin implementing the agreement. Implementation actions are unknown at this time, but are assumed to include surveys throughout the Restoration Area and in Millerton Reservoir for cultural resources, identification of impacts of flows to those resources, and evaluation and recovery of resources that may be impacted.

- Boat Launch Ramps – Mitigation Measure REC-9 in the PEIS/R ROD includes extending Millerton Lake boat ramps or constructing a new low-water ramp to allow boat launching at the lower pool elevations that may result from Interim and Restoration flows during Dry and Critical-High Years. During the Five Year Vision, Reclamation will work with the California Department of Parks and Recreation to develop a plan to extend the boat launch ramps. If a Dry or Critical-High year occurs, Reclamation will also work to extend the launch ramps.

- Traffic Detour Planning – Mitigation Measure TRN-7 and LUP-4 in the PEIS/R include the development and implementation of a long-term vehicular detour plan for routes that may be inundated as a result of the release of Interim and Restoration flows. Development and implementation of the plan is expected to occur during the Five Year Vision.

- Sand Slough / Eastside Bypass Sand Removal Project – Sand currently deposits near El Nido Road in the Eastside Bypass, causing Restoration Flows to back up the Eastside Bypass before moving downstream. This sand removal project in the Eastside Bypass is estimated at $1,200,000 in FY 2015 including design, environmental compliance, and permitting. This does not include a bridge.

The estimated costs for the conservation strategy and flow-related mitigation measures and environmental commitments for the Five Year Vision (FY 2015 to 2019) are provided in Table 4-5.

Table 4-5. Estimated Conservation Strategy and Flow-related Mitigation Measures Costs for the Five Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Invasive Species Control	$300	$300	$300	$300	$300	$1,500
Vegetation Monitoring & Other	$0	$0	$200	$200	$200	$600
Re-consultation on Flows	$0	$0	$0	$1,500	$0	$1,500
Implement Conservation Strategy Actions for Flows	$0	$0	$0	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring) - State	$190	$700	$500	$490	$480	$2,390
Channel Capacity Advisory Group (Includes Erosion Monitoring) – Federal	$100	$100	$100	$100	$100	$500
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0	$0
Steelhead Monitoring	$228	$228	$228	$228	$228	$1,140
Programmatic Cultural Resources Consultation [1]	$100	$1,500	$1,000	$0	$0	$2,600
Millerton Lake Boat Ramps	$50	$0	$200	$0	$0	$250
Traffic Detour Planning	$50	$10	$0	$0	$0	$60
Sand Slough / Eastside Bypass Sand Removal	$1,200	$0	$0	$0	$0	$1,200
Total	$2,218	$2,838	$2,528	$2,818	$1,308	$11,710

Notes: All costs are Federal costs unless otherwise noted.

1. Costs are estimated at this time and will depend on the final Programmatic Agreement and the number, significance, and impacts to cultural resources found during survey activities. Long-term preservation costs are not included, but may be necessary if any preservation of resources is determined necessary.

Uncertainties and possible future changes to the conservation strategy and flow-related mitigation measures and environmental commitments for the Five Year Vision include the following:

- Conservation Strategy – Re-consultation on Flows – The level of effort for this is generally unknown at this time. Costs assume some modeling and analysis.

- Channel Capacity Advisory Group (includes Erosion Monitoring) – The amount of erosion management actions is unknown at this time and a limited amount of funding is included for erosion management actions in the cost estimate.

- Cultural Resources – The level of effort will depend on the final Programmatic Agreement and the number, significance, and impacts to cultural resources found during

survey activities. Long-term preservation costs are not included, but may be necessary if any preservation of resources is determined necessary.

- Boat Launch Ramps – The construction actions are triggered by a future Dry or Critical High Year where the release of Restoration Flows impacts the elevation of Millerton Lake. Therefore, the actual construction timeframe is unknown and may occur sooner or later than estimated.

- Hills Ferry Barrier Operating Agreement – During this time period, the current Hills Ferry Barrier operating agreement will expire. The new agreement may have slightly different terms and the SJRRP may pursue specific allowances in the new operating agreement to support the establishment of spring-run and fall-run salmon. Such changes could also include identification of the permanent removal of the barrier.

4.4.2 Flow Management and Monitoring

Flow management and monitoring actions includes all actions under Paragraph 13 of the Settlement. Specifically, for the Five Year Vision this includes the following:

- Daily Flow Management and Monitoring – Daily flow management and monitoring activities, including coordinating flow activities and flow changes consistent with the Restoration Flow Guidelines, including Gravelly Ford flow targets, and the coordination conditions in Reclamation's water rights at Friant Dam related to the SJRRP.

- Stream Gaging – Monitoring and maintaining a network of stream gages at the locations specified in Paragraph 13(g) of the Settlement and additional locations determined beneficial for the SJRRP management decisions. Funding includes operations and maintenance costs, quality control of data, and replacement of key parts on an approximately 5 year basis.

- Unexpected Seepage Losses – Identifying Unexpected Seepage Losses and acquisition of water for Unexpected Seepage Losses. This includes the acquisition of water or options on water to meet the flow targets consistent with the Restoration Flow Guidelines and Paragraph 13(c) of the Settlement. Within the Five Year Vision, no acquisition of Unexpected Seepage Loss water is anticipated and no funding is allocated to this effort. Reclamation may be able to acquire water for Unexpected Seepage Losses through management of Unreleased Restoration Flows (some labor costs would be needed to facilitate these agreements). However, the amount acquired will be opportunistic and will depend greatly on hydrology, Unreleased Restoration Flows, and the ability to find mutually agreeable terms with the Friant Division long-term contractors to enter into such agreements.

- Unreleased Restoration Flows – Managing Unreleased Restoration Flows consistent with Paragraph 13(i) of the Settlement. Although the 2012 Framework assumed that there would be little management of Unreleased Restoration Flows, Reclamation has completed a Draft Guidance Document on the Management of Paragraph 13(i) Unreleased Restoration Flows (SJRRP 2013) along with the analysis included in Appendix G of this Revised Framework since that time and expects to need to manage

Unreleased Restoration Flows within the Five Year Vision (FY 2015 to 2019). The cost for this effort is assumed to be limited to staff time to identify opportunities and enter into agreements to manage Unreleased Restoration Flows.

- Restoration Flow Guidelines – The Restoration Flows Guidelines were completed in December 2013. However, the Guidelines recognized that revisions may be necessary as more information is known over time. Within the Five Year Vision, it is assumed that some revisions to the Restoration Flow Guidelines will be necessary (i.e., flow forecasting, determining if Gravelly Ford is a compliance point or target, and managing flood releases to best meet riparian recruitment needs).

- Data Management – The SJRRP is collecting a variety of data on both physical and biological components of the San Joaquin River. Reclamation is in the process of developing a cloud-based data management system to compile and make all of this data easily accessible for Program actions and to the general public.

- MAP Actions to Inform Flow Decisions – MAP studies and monitoring activities funded through the MAP process that inform flow management decisions. Such actions could include both physical and biological studies and monitoring actions. Specific studies and monitoring activities would be determined through the MAP process.

- Water Right Compliance and Annual Report – Completing an Annual Report to report on compliance with the conditions in Reclamation's water rights related to the SJRRP.

The estimated costs for these flow actions for the Five Year Vision (FY 2015 to 2019) are provided in Table 4-6.

Uncertainties and possible future changes in Flow Management and Monitoring Actions include the following:

- Unexpected Seepage Losses and Unreleased Restoration Flows – While Reclamation can develop cost-neutral banking, storing, exchange, transfer, and sale on water and options for specific quantities, the ability to reach the quantities called for in the Settlement is unknown.

- Restoration Flow Guidelines – Costs will vary depending on the number of revisions in the future.

- Data Management – These costs may vary over time with changes in Reclamation policies, stakeholder requirements, and new and / or improved software development.

- MAP Actions to Inform Flow Decisions – The MAP studies and monitoring actions will vary year-to-year depending upon the information needs, opportunities provided by hydrology and fisheries information needs. It is assumed that costs would not exceed those identified above, but they may be less.

Table 4-6. Estimated Flow Management and Monitoring Costs for the Five Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77	$385
Stream Gaging – Federal [1]	$119	$119	$218	$119	$119	$694
Stream Gaging - State	$70	$70	$70	$70	$70	$350
Unexpected Seepage Losses	$0	$0	$0	$0	$0	$0
Unreleased Restoration Flows [2]	$36	$36	$36	$36	$36	$180
Restoration Flow Guidelines [3]	$126	$0	$0	$126	$0	$252
Data Management [4]	$250	$258	$133	$68	$50	$759
MAP Actions to Inform Flow Decisions – Federal [5]	$750	$750	$750	$750	$750	$3,750
MAP Actions to Inform Flow Decisions – State [5]	$350	$350	$200	$250	$250	$1,400
Water Right Annual Report	$37	$37	$37	$37	$37	$185
Total	$1,815	$1,697	$1,521	$1,533	$1,389	$7,955

Notes: All costs are Federal costs unless otherwise noted.
1. Assumes operations and maintenance, quality control of data, and replacement of key parts on an approximately 5 year basis.
2. Assumes staff time to identify opportunities and enter into agreements to manage Unreleased Restoration Flows.
3. Assumes revisions to the Restoration Flow Guidelines approximately every 3 years.
4. Includes completion of database in FY 2015 and FY 2016. Extensive data entry in FY 2017. Ramp down to annual data entry in FY 2018 and FY 2019.
5. MAP studies and monitoring actions includes only those actions necessary for flow management and monitoring and making flow decisions. Additional MAP studies may be funded through other Program actions, such as Channel and Structural Improvement Projects and Fish Establishment Actions.

4.4.3 Seepage and Levee Stability

Seepage and levee stability includes the actions necessary to meet the commitments in the PEIS/R ROD to release flows in a way that does not result in material adverse impacts to adjacent agricultural lands from seepage or result in material adverse impacts to levee stability. Below are the groundwater seepage, and levee stability actions that are anticipated in the Five Year Vision.

- Groundwater Seepage – Groundwater seepage concerns include waterlogging and root zone salinity. Reclamation has installed over 200 shallow monitoring wells in seepage-prone areas with landowner cooperation, but does not have local information everywhere. Therefore, for this document, Reclamation assumes that properties will experience groundwater seepage issues when the water surface elevation in the river is equal to the ground surface elevation of a farm field. Properties adjacent to the Eastside Bypass, in Reach 4A, and in Reach 3 may experience groundwater seepage concerns at flows of up to 1,300 cfs.

  Reclamation anticipates completing the Eastside Bypass groundwater seepage projects to allow flows up to approximately 300 cfs below Sack Dam in 2016. Reach 4A groundwater seepage projects that will allow flows up to approximately 500 cfs below

Sack Dam are scheduled for completion in 2017. The rest of the seepage projects required for flows up to 1,300 cfs are scheduled for completion by 2018.

- Levee Stability – Levee capacities through the SJRRP Restoration Area as defined by the Channel Capacity Report's "then-existing" channel capacity, a commitment in the SJRRP ROD, may be lower than channel design capacity (as defined in the State Plan of Flood Control). DWR is leading an effort to collect geotechnical data and evaluate the levees, informing the need for future levee remediation. However, this geotechnical information will not be complete for all levees for several years. Therefore, this Five Year Vision assumes that any flow higher than 2 feet onto the levee will require remediation based on preliminary DWR analysis of the Middle Eastside Bypass. Only the Middle Eastside Bypass is a concern at flows below the Reach 2B channel capacity (currently estimated at 1,120 cfs, but previously estimated at 1,300 cfs, so actions are taken to increase capacity elsewhere to at least 1,300 cfs).

  Levee stability schedules are in progress. Geotechnical data was collected in 2013 in the Eastside Bypass and Reach 2A. Reports analyzing this information and determining the levee capacity will be completed later in 2015. At that time, DWR will know whether levee remediation efforts are needed in these reaches. Levee construction financing is needed for a firm schedule, but DWR anticipates the levee remediation work could be completed by the end of 2019 if funding is available immediately after the geotechnical data analysis is done.

The groundwater seepage projects for properties potentially impacted below 1,300 cfs and estimated costs for seepage projects to address these properties for the Five Year Vision are provided in Table 4-7. For groundwater seepage, cost estimates were developed for interceptor lines, fee-simple acquisition, and seepage easements. It is assumed that interceptor lines cost $488 per linear foot, based on preliminary designs from Reclamation's contractor including construction and operations and maintenance costs into the future. The high end of the 2013 Land Trends of the California Chapter of the American Society of Farm Managers and Rural Appraisers was used to estimate fee-simple acquisition, based on each property's county, crop type, and water supply (ASFMRA, 2013). Seepage easements were estimated at 60 percent of fee-title based on appraisals conducted by Reclamation to date. Environmental compliance ($30,000 each), appraisal ($20,000 each), and cultural resources costs (depending on likelihood, $5,500 per mile to $175,000 for the property) were also included. The seepage project for one landowner in Reach 4A, one landowner adjacent to the Eastside Bypass, and a temporary rental for one landowner in the Eastside Bypass were completed in FY 2014. These three FY 2014 seepage project costs total $17,568,800. However, the costs for these projects are included in Table 4-7 as these projects are necessary to reach flows of 1,300 cfs.

Table 4-7. Groundwater Seepage Projects and Estimated Costs for Properties Impacted Below 1,300 cfs

Reach	Impacted Area (acres)	Estimated Cost
2A	0	0
2B	194	$2,756,000*
3	2,548	$17,940,000
4A (required for 500 cfs)	1,647	$10,971,000
Eastside Bypass (required for 300 cfs)	5,207	$16,080,000
5	0	0
Total	**9,596**	**$44,991,000 ** **

Notes:

* These costs are not included in the total, as these properties have to be purchased for the Mendota Pool Bypass and Reach 2B Project, and therefore, the costs are included under that project.

** Total is great than identified in Table 4-9 as this table identifies costs for achieving 1,300 cfs only. Table 4-9 includes seepage costs to achieve 2,000 cfs in the First Five Year Vision. Reclamation will work to address seepage such that all reaches have 2,000 cfs capacity in the First Five Year Vision and wanted to ensure that funding would be available to do. However, the "goal" of the First Five Year Vision is to achieve 1,300 cfs capacity as reflected in this table.

The levee remediation projects to address levee stability issues where 1,300 cfs exceeds 2 feet above the levee toe and estimated costs to address these areas for the Five Year Vision are provided in Table 4-8. In the Middle Eastside Bypass, irrigation water commonly drains to the bypass and slurry walls preventing field drainage to the Eastside Bypass may represent an impact to the landowner. Therefore, drains were assumed as the levee remediation method of choice at a unit cost of $488 per linear foot. This unit cost is based on the average linear foot cost of interceptor lines from preliminary designs by Reclamation's groundwater seepage contractor, including construction and operations and maintenance costs. The costs of levee remediation may increase if other methods are selected to address levee stability issues.

Table 4-8. Levee Remediation to Address Levee Stability Issues where 1,300 cfs Exceeds 2 feet above Levee Toe

Reach	Impacted Left Levee Length (feet)	Impacted Right Levee Length (feet)	Total Impacted Levee Length (feet)	Total Cost of Remediation with Toe Drains	Total Cost of Remediation with Slurry Walls
2A	0	0	0	0	0
3	0	0	0	0	0
4A	0	0	0	0	0
5 (all)	0	0	0	0	0
Middle Eastside Bypass	6,630	870	7,500	$3,660,000	$13,500,000
Lower Eastside Bypass	0	0	0	0	0
Total	**6,630**	**870**	**7,500**	**$3,660,000**	**$13,500,000**

The estimated costs for the seepage and levee stability projects by year, for the Five Year Vision, are provided in Table 4-9. Costs include some properties that are not necessary to fix until higher flows. For example, some properties with the same owner as higher priority properties are included earlier in the seepage program in order to take advantages of efficiencies when evaluating and doing seepage projects on all of a landowner's properties at once. As it is anticipated that seepage projects to get to 1,300 cfs can be completed by 2018, and budgets in later years need to be saved for site-specific projects, Table 4-9 below also includes seepage projects to get to approximately 2,000 cfs. Groundwater seepage issues may be fixed to 2,000 cfs by the end of this Five Year Vision. Thus, the costs in Table 4-9 below do not match the costs in Table 4-7 above. Levee stability costs assume $13,500,000 for levee construction even though slurry walls are not feasible in the Middle Eastside Bypass (slurry wall costs were used to be conservative). Levee stability costs also include $4,232,000 for the Priority 2 geotechnical investigations and $6,613,000 for the Priority 3 geotechnical investigations. Levee stability costs include levee remediation to 1,300 cfs.

Table 4-9. Estimated Seepage, Levee Stability, and Flowage Easement Costs for the Five Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Seepage	$15,574	$15,805	$7,650	$10,867	$11,369	$61,265
Levee Stability (State lead)	$3,190	$2,539	$5,462	$2,423	$11,010	$24,624
Total	$18,764	$18,344	$13,112	$13,290	$22,379	$85,889
Notes: All costs are Federal costs unless otherwise noted. Levee stability costs include all geotechnical investigations for Priority 2 and 3 levees. Levee stability costs do not include potential levee stability issues in Reach 2B for flows up to 1,300 cfs.						

Uncertainties and possible future changes in seepage and levee stability actions include the following:

- Levee stability information will improve when DWR finishes the geotechnical investigations and reports on Priority 1, 2, and 3 locations and it is likely that the levee costs included herein will reduce due to greater knowledge of levee soils and stability. However, subsidence information has not been included in the analysis to date and could reduce channel capacities and increase areas needing levee work. Levee costs are highly uncertain at this time.

- Landowner refusal to work with Reclamation or DWR could set back the seepage or levee stability actions and delay this schedule.

- Seepage project costs shown above include assumptions of project type. The project types are likely to change based on future discussions with landowners. For those projects that are assumed to be land easements or acquisitions, changes in land values over time would also change costs.

- Archaeological investigations will be required for physical seepage project construction. It is assumed this effort can be completed concurrently with final design and would not

take more than 1 year. If Section 106 compliance takes longer, seepage project schedule impacts would occur.

The responsibilities for levee stability costs are unknown at this time. In some reaches, the historical operations and maintenance of the channel and levees may have not been completed to the level required in the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project (The Reclamation Board 1967). Although all reaches of the river, except Reach 2B and Reach 4B1, were designed to carry flows sufficient to pass the SJRRP's Restoration Flows when the Flood Control Project was constructed, the current conveyance capacity of these reaches appears to be much less. At this time, it is unclear what agency or organization has responsibility to improve these levees such that full Restoration Flows can be conveyed in the river. This an issue beyond the scope of this Revised Framework that will need to be addressed as the SJRRP moves forward. Recognizing that these actions need to occur to fully implement the Settlement, the costs are included in this Revised Framework. However, the costs of these actions are likely not the responsibility of the SJRRP and these actions should more appropriately be funded outside of the SJRRP. For planning purposes, the levee stability costs were designated as a State cost since it is assumed that DWR will continue to lead the work on levee evaluation and improvements if State funds are available. Levee costs are expected to decrease.

4.5 Channel and Structural Improvements

The following are the channel and structural improvements actions anticipated in the Five Year Vision:

- Construct key components of the Mendota Pool Bypass (either Compact Bypass Alignment or Fresno Slough Dam, based on the alternatives currently under consideration)

- Complete the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements EIS/R and associated Report to Congress

- Complete final design and any additional permitting actions for the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project and address loss of juveniles in the Arroyo Canal with a temporary fish screen, if determined necessary

- Provide passage, if determined necessary, for anadromous salmonids at the following key barriers to migration: Dan McNamara Road; Merced National Wildlife Refuge Weir; and Eastside Bypass Control Structure

These actions are described in more detail below.

4.5.1 Mendota Pool Bypass

The Mendota Pool Bypass is anticipated to be constructed in the Five Year Vision. This would allow for unimpeded fish passage around Mendota Dam and Pool and significantly reduce

juvenile and adult salmon entrainment and mortality in over 15 diversion facilities the Mendota Pool. For the purposes of this Revised Framework, it is assumed that one of the two alternatives to bypass the Mendota Pool currently under consideration in the NEPA process, the Compact Bypass or Fresno Slough Dam, would be constructed. The channel capacity of Reach 2B will continue to be limited to the existing levee capacity.

For the purposes of the cost estimate in this Revised Framework, it is assumed that the Compact Bypass alternative is the constructed alternative. This was selected as this alternative is the preferred alternative for the local landowners and water districts and also meets Reclamation's needs. However, the use of this alternative for costing purposes in this Revised Framework does not represent a final agency decision or final selection of this alternative – the final agency decision will continue to be made through the joint NEPA/CEQA process that is currently underway.

Necessary components of the Compact Bypass alternative for the Mendota Pool Bypass include the following:

- Geotechnical Investigations, estimated at $2 million in FY 2014 and 2015 – Several hundred boreholes are necessary to inform foundation and levee design for the Mendota Pool Bypass and Reach 2B project, as well as geotechnical tests, and laboratory analysis. Approximately 1/3 of this work is for the Mendota Pool Bypass, but there are efficiencies to doing the overall Reach 2B geotechnical investigation at the same time.

- Land Acquisition, estimated at $3.92 million – Approximately 200 acres of land acquisition or easements are necessary for construction of the Compact Bypass. Cost estimates are based on the average values in the 2014 Land Trends of the California Chapter of the American Society of Farm Managers and Rural Appraisers report for Fresno County almonds and rangeland. These are order of magnitude estimates as appraisals have not been completed.

- Compact Bypass Excavation and Grading, estimated at $38.02 million – Grading is necessary to create a low flow channel, put in grade control, and create floodplain habitat. Additional grading may be done upstream of the Compact Bypass in the Reach 2B channel to increase channel capacity.

- Compact Bypass Levees, estimated at $16.9 million – These are necessary for passage of flows without flooding.

- Compact Bypass Bifurcation Structure, estimated at $12.39 million – This structure is necessary to control flow of water in the rare case of an Exchange Contractor delivery to Mendota Pool from Millerton Reservoir. Gates will normally be open to allow Restoration Flows into the Compact Bypass. The control structure may be sited at a lower elevation that minimizes upstream backwater, and reduces the head drop across the Compact Bypass.

- Mendota Pool Bifurcation Structure, estimated at $11.83 million – This structure is necessary to control flow of water in the rare case of an Exchange Contractor delivery to Mendota Pool from Millerton Reservoir. Gates will normally be shut.

- Columbia Canal Siphon, Pumps and Regrading, estimated at $25.41 million – Necessary to maintain Columbia Canal's water supply with the same point of diversion.

- Mitigation Costs, estimated at $2 million – May be necessary to mitigate impacts for the construction project.

See the appraisal level design packages (DWR, 2011) for design and cost estimate details. Cost estimates above include dust control, Stormwater Pollution Prevention Plans, environmental mitigation for revetments at 20 percent of the revetment total, design (15 percent of construction cost), mobilization (5 percent of construction cost), contract cost contingencies (25 percent), and non-contract costs (35 percent). Non-contract costs include Reclamation labor for managing the construction contract, permitting, oversight, construction inspection, and similar. Costs have been indexed to April 2015 values using the Building Cost Index from the Engineering News Record. The estimated costs for the Mendota Pool Bypass by year, for the Five Year Vision are provided in Table 4-10.

Table 4-10. Estimated Mendota Pool Bypass Costs for the Five Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Mendota Pool Bypass	$2,300	$15,017	$38,023	$28,727	$29,407	$113,474
Support (State Cost)	$20	$20	$20	$20	$20	$100
Notes: All Mendota Pool Bypass costs are Federal costs. Support costs include DWR modeling.						

Uncertainties and possible future changes include the following:

- For the purposes of the cost estimate in this update, it is assumed that the Compact Bypass alternative is the constructed alternative to address the Mendota Pool Bypass requirements in the Settlement. If another alternative is selected, costs will change.

- Cost estimates are all appraisal level, and thus are very preliminary and subject to change.

- Land prices may increase or decrease over time.

- Final fish passage design criteria will have a large effect on structure costs. Factors which can greatly increase costs include whether fish require raised roadways, passage protection during flood flows, elimination of upstream backwater conditions, sturgeon passage, upstream juvenile salmon passage, or passage for other native fishes.

- Future Value Engineering studies could result in cost reduction ideas.

- Schedules and costs represent costs for Federal projects. Local knowledge and partnership could reduce costs or schedules.

4.5.2 Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project and Report to Congress

The Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project environmental compliance document and report to Congress, as required in the Settlement Act, are anticipated to be completed during the Five Year Vision. While appraisal level designs are complete, no further design or analysis work is anticipated beyond that necessary to support the environmental documentation. Completing these documents will help provide certainty for the routing of fish and flows through this area, informing landowners as well as ongoing seepage and levee stability projects.

Specific anticipated activities include:

- Monitoring and data collection in the Reach 4B1 channel, estimated at $548,200. This includes soil, bathymetry, water quality, and temperature monitoring in the Reach 4B1 channel.

- Labor for the Reach 4B Report to Congress required in Section 10009(f)(2) of the Settlement Act, and many meetings to discuss, estimated at $327,000.

The estimated costs for the Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project by year, for the Five Year Vision are provided in Table 4-11.

Table 4-11. Estimated Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project Costs for the Five Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Reach 4B EIS/R and Report to Congress	$190	$215	$290	$190	$190	$1,075
Federal	$150	$175	$250	$150	$150	$875
State	$40	$40	$40	$40	$40	$200
Notes: All costs are Federal costs.						

4.5.3 Temporary Arroyo Canal Fish Screen and Temporary Sack Dam Fish Passage Project

Due to the uncertainties of the subsidence area recently found near the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project, this project is being delayed until the Ten Year Vision. This will allow for additional time to address the subsidence issue and continue monitoring actions to better determine the long-term subsidence rates in the area.

With this delay, fish entrainment into Arroyo Canal could be challenge until the permanent Arroyo Canal fish screen is constructed, but it is currently unknown to what extent entrainment in the canal is a concern. In addition, fish passage over Sack Dam would also be a concern until the permanent Sack Dam facility is constructed. Therefore, within the Five Year Vision, juvenile fish entrainment at the Arroyo Canal would be studied and a temporary fish screen is assumed to be constructed. In addition, a temporary fish passage facility is also assumed at Sack Dam.

For the Arroyo Canal, the following activities would occur within the Five Year Vision:

- Juvenile mortality study in Arroyo Canal, estimated at $144,000. Includes PIT tagging fish and determining the percentage or fraction of tagged fish that end up in the Arroyo Canal.

- Design of a temporary fish screen at Arroyo Canal, estimated at $50,000. Includes staff time for Reclamation engineers to design the temporary fish screen.

- Environmental compliance and permitting for a temporary fish screen at Arroyo Canal, estimated at $27,000. Includes NEPA and CEQA compliance in an Environmental Assessment, Indian Trust Assets, an Endangered Species Act Effects Analysis, and Section 106 of the National Historic Preservation Act only.

- Temporary fish screen, estimated at $1,000,000.

Temporary fish passage facilities at Sack Dam are estimated at $520,000. These fixes are assumed to consist of retrofitting the existing fish ladder at Sack Dam to pass salmon.

Both temporary facilities are not expected to meet current NMFS or DFW fish passage or fish screening criteria. However, they are assumed to reduce entrainment and allow for improved passage conditions and thus, be beneficial to anadromous fish. It is assumed that NMFS and DFW would issue the appropriate permits and approvals for these facilities even though they would not meet current fish passage and screening criteria.

The estimated costs for the Temporary Arroyo Canal Fish Screen and Temporary Sack Dam Fish Passage Project by year, for the Five Year Vision is provided in Table 6-12.

Table 4-12. Estimated Temporary Arroyo Canal Fish Screen and Temporary Sack Dam Fish Passage Project Costs for the Five Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Arroyo Canal Temporary Facilities	$144	$77	$1,000	$0	$0	$1,221
Sack Dam Temporary Facilities	$70	$450	$0	$0	$0	$520
Total	**$214**	**$527**	**$1,000**	**$0**	**$0**	**$1,741**

Notes: All costs are Federal costs.

Uncertainties and possible future changes include the following:

- Access from San Luis Canal Company will be needed to set-up a PIT tag array in Arroyo Canal.

- Costs and level of effort could increase substantial and/or this action may not be feasible if NMFS and/or DFW cannot permit and/or approve these temporary facilities without them meeting fish passage and fish screening criteria. In this case, these facilities may not be constructed.

4.5.4 Passage for Anadromous Salmonids at Key Barriers to Migration

Although not identified as a Paragraph 11 item, based on information collected by the SJRRP, there are a series of barriers to fish passage in the Restoration Area. As the goal of the Five Year Vision is to provide fish passage over major barriers to migration such that both adult and juvenile salmon can complete their migration routes without human assistance at the end of the five years, this Five Year Vision includes addressing these barriers to fish passage.

During the Five Year Vision, Restoration Flow and fish will pass through the San Joaquin River, into the Eastside Bypass and then back into the San Joaquin River. Structures with possible fish passage issues in the Chowchilla Bypass and Eastside Bypass Reach 1 would only present a fish passage challenge in flood years (approximately 1 out of every 4.5 years with the Restoration Flows). In addition, flows can be adjusted within the flexible flow period so that fish pass through most of the lower reaches of the San Joaquin River during either the spring pulse or the fall pulse. Therefore, structures in Reaches 2 through 5 with impaired passage at flows less than 350 cfs are lower priority. Structures with impaired passage at flows above 350 cfs could be a passage impediment during the spring and fall pulses, and would detract from functional connectivity. For example, the San Joaquin River (river side) Bifurcation Structure near the Chowchilla Bypass is a possible fish passage barrier at flows of less than 350 cfs. However, it meets depth, velocity, and jump criteria at flows greater than 350 cfs. As long as fish are passing out of Reach 2B during the spring and fall pulses with flows of 350 cfs or greater, this structure is not a fish passage concern.

The Eastside Bypass Rock Weir, as another example is a depth barrier for fish only at flows less than 200 cfs. Flows in the Eastside Bypass are anticipated to be low in the near term. However, permitting and environmental compliance for this effort would likely take a year or more, by which time seepage projects should be done to get more than 200 cfs into the Eastside Bypass. Thus, this project is not included on the list of structures to be addressed in the Five Year Vision below.

Key barriers for migration that should be addressed in the first 5 year vision include:

- Dan McNamara Road, estimated at $990,000. Dan McNamara Road is a potential depth passage barrier at flows below 600 cfs. As passage would be impeded during the fall pulse and flows into the Eastside Bypass during the spring pulse will remain low for several years, changes are needed. Options include closing down the road and regarding it such that it is no longer a passage barrier. This option would require close coordination with Merced County as Dan McNamara Road is a county road. However, as the Sandy Mush Road bridge is within a few hundred feet of this low flow crossing, permanent closure of the road might be possible. Fish passage concerns may also be addressed by installing culverts. For the purposes of costs for this Revised Framework, the higher estimated cost for installation of culverts is used. However, both options would be pursued.

- Upper Merced National Wildlife Refuge Weir Reoperation, estimated at $0. The upper Merced National Wildlife Refuge Weir (Weir #1) is a depth barrier to fish passage at flows less than 700 cfs. With the boards out, the structure is no longer a barrier to fish passage. Options include working with the refuge to change the operation of the weir and installing a pump to provide an alternate water diversion mechanism.

- Lower Merced National Wildlife Refuge Weir, estimated at $1,250,000. The lower Merced National Wildlife Refuge Weir (Weir #2) is a jump barrier to salmon at all flows less than 3,000 cfs. When the boards are out, it is a jump barrier at flows less than 100 cfs and possibly a depth barrier at flows less than 500 cfs. Significant debris has accumulated at the weir. This action would involve working with the refuge to change operations at the weir, installing a pump to provide an alternate water diversion mechanism, and cleaning out the debris stuck in the weir. The higher estimated cost, for installation of a pump with a fish screen to replace the need for both refuge weirs, is included here. This cost is from the Reach 4B project. Non-contract costs are not included as environmental compliance will be done as part of the overall project.

- Eastside Bypass Control Structure, estimated at $1,980,000. The Eastside Bypass Control Structure is a depth barrier at flows less than 900 cfs, and a jumping barrier at flows less that 500 cfs. A rock ramp fish ladder could be installed. This cost is from the Sufficient Flows study.

Costs above include mobilization, design (15 percent), construction contingency (25 percent) and non-contract costs (35 percent of total costs), including estimated labor for environmental compliance and permitting. Possible mitigation costs are not included.

The estimated costs for passage for anadromous salmonids at key barriers to migration by year, for the Five Year Vision, is provided in Table 4-13.

Table 4-13. Estimated Passage for Anadromous Salmonids at Key Barriers to Migration Costs for the Five Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Dan McNamara Road and Eastside Bypass Control Structure (State lead)	$250	$550	$500	$1,060	$1,610	$3,970
Merced National Wildlife Refuge Weirs Reoperation (Federal cost)	$50	$1,200	$0	$0	$0	$1,250
Total	$300	$1,750	$500	$1,060	$1,610	$5,220

Uncertainties and possible future changes include the following:

- The Lost Lake Rock Weir could need minor modification for fish passage. This Revised Framework does not include any effort or costs to address this.

- DWR is currently completing a fish passage assessment, and as part of this effort, DWR will be developing preliminary designs. Costs could change as a result.

- Final fish passage design criteria will have a large effect on structure costs. Factors which can greatly increase costs include whether fish require raised roadways, passage protection during flood flows, elimination of upstream backwater conditions, sturgeon passage, upstream juvenile salmon passage, or passage for other native fishes.

4.6 Fish Establishment

Over the Five Year Vision, the SJRRP will focus on the following Fish Establishment actions:

- Salmon Conservation and Research Facility Construction – DFW will construct the Conservation Facility and Reclamation will construct a water supply system at Friant Dam providing 20 cfs for use at the Conservation Facility. Reclamation will also need to complete a Water Service Agreement for non-consumptive use of CVP water at the Conservation Facility. DFW currently anticipates the facility to be operational by November 2018 and will eventually annually produce 1.5 million spring-run juveniles.

- Operation of the Interim and Conservation Facility – DFW will continue to operate the Interim Conservation Facility and the permanent Conservation Facility, once constructed. Funding is anticipated to be provided by Reclamation for the operations of these facilities through June 30, 2022, subject to Federal appropriations and executed funding agreements.

- Spring-run Donor Stock Collection – USFWS and DFW will complete annual spring-run donor stock collection and tagging consistent with the Section 10(a)(1)(A) permits issued by NMFS. This action will result in ongoing inputs into the broodstock and in-river populations. In addition, if the appropriate permits are issued and the conditions are favorable, USFWS and DFW would work to being collecting wild stocks for broodstock populations.

- Trap and Haul of Adult Salmon – As additional channel capacity develops and there is improved river connectivity under varying hydrological condition, Reclamation will continue trap and haul of adult fall-run salmon and begin trap and haul of adult spring-run. It is anticipated that trap and haul will be needed through the next five years and continue until Mendota Pool Bypass is completed.

- Genetics Monitoring – The SJRRP will continue genetic analysis for spring-run and fall-run. Genetic management of broodstock fish and of the in-river population are vital to the SJRRP's ability to establish self-sustaining salmon populations in good condition, minimize genetic impacts on donor stock populations and augment the long-term sustainability of the San Joaquin River salmon populations. This effort is currently funded by Reclamation with NMFS' Southwest Fisheries Science Center completing the work, under contact to Reclamation until 2016. Another contract will be needed in 2017.

- Segregation Actions – The Implementing Agencies will continue to investigate feasible methods to segregate fall- and spring-run spawners to reduce interbreeding between the two runs. The importance of separating the spawners will not be well understood until spring-run are returning to the system, which may first occur in spring 2016. Potential impacts observed in other systems include redd superimposition (disturbance of incubating spring-run eggs) and genetic introgression (fall- and spring-run populations begin to merge and lose distinctiveness).

- Complete Permit Application and Make Permitting Decision for use of Wild Spring-run Stocks – During the Five Year Vision, USFWS will complete a permit application for the use of wild spring-run stocks and submit it to NMFS. NMFS will also make a decision on the permit within the Five Year Vision.

- Complete Permit Application and Make Permitting Decision for Continuation of Broodstock and Direct Release Efforts – The USFWS has submitted two permit applications, one for broodstock and one for direct release of spring-run into the river, to NMFS. Both applications requested 5 years terms. On October 11, 2012, NMFS issued Section 10(a)(1)(A) Permit 14868. This permit authorizes USFWS to collect, transport, rear, handle, and tag individuals to establish a broodstock of spring-run at the Interim Conservation Facility. In March 2014, NMFS issued Section 10(a)(1)(A) Permit 17781 for direct release of spring-run into the San Joaquin River. The existing permits are limited to 5 years (they expire in 2017 for broodstock and 2019 for direct release). During the Five Year Vision, USFWS will complete permit application(s) for the continuation of the broodstock and direct release efforts and submit these to NMFS. NMFS will also make a decision on these permits within the Five Year Vision. It is assumed that the new permits would last through the duration of the SJRRP's broodstock and direct release efforts and no additional 10(a)(1)(A) permits would be needed in the future.

- Issue Annual Technical Memorandum Consistent with 10(j) and 4(d) Rule Package – Consistent with Section 10011(c)(2) of the Settlement Act, the Secretary of Commerce issued a final rule pursuant to section 4(d) of the Endangered Species Act governing the incidental take of reintroduced spring-run salmon. The rule requires the preparation of an annual technical memorandum. During the Five Year Vision, NMFS will continue to issue the annual technical memorandum.

The estimated costs for fish establishment actions by year, for the Five Year Vision, are provided in Table 4-14.

Table 4-14. Estimated Fish Establishment Costs for the Five Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Salmon Conservation and Research Facility Construction (State Cost)	$0	$0	$13,167	$0	$0	$13,167
Conservation Facility Water Supply Line (Reclamation cost) [1]	$50	$650	$1,800	$0	$0	$2,500
Operation of the Interim and Conservation Facility [2]	$700	$700	$700	$700	$700	$3,500
Spring-run Donor Stock Collection	$80	$80	$80	$80	$80	$400
Trap and Haul of Adult Salmon	$592	$592	$592	$592	$592	$2,960
Genetics Monitoring [2]	$210	$199	$239	$200	$200	$1,048
Segregation Actions	$200	$200	$200	$200	$200	$1,000
Complete Permit Application and Make Permitting Decision for use of Wild Spring-run Stocks [2, 3]	$0	$0	$0	$0	$0	$0
Complete Permit Application and Make Permitting Decision for Continuation of Broodstock and Direct Release Efforts [2, 3]	$0	$0	$0	$0	$0	$0
Issue Annual Technical Memorandum pursuant to 10(j) and 4(d) Rule Package [2, 3]	$0	$0	$0	$0	$0	$0
Total	$1,832	$2,421	$16,778	$1,772	$1,772	$24,575

Notes:

1. Reclamation completed an Appraisal Report in May 2013 estimating $1.8 million for water supply construction. Reclamation intends to award a financial assistance agreement in FY 2014 to fund this project. Cost reflect construction oversight actions and management of the financial assistance agreement.
2. This is a Federal cost only for this time period.
3. The cost of this effort is included in USFWS and NMFS Program Staffing and Administrative costs.

Uncertainties and possible future changes include the following:

- Segregation Actions – The method and long-term need for this action is uncertain at this time. Costs provided above include study and temporary segregation actions. In the event that long-term segregation of the runs is needed, a permanent segregation facility should be considered. This could result in higher construction costs, but reduce overall annual costs.

- Hills Ferry Barrier Operating Agreement – During this time period, the current Hills Ferry Barrier operating agreement will expire. The new agreement may have slightly different terms and the SJRRP may pursue specific allowances in the new operating agreement to support the establishment of spring-run and fall-run salmon. Such changes could also include identification of the permanent removal of the barrier.

4.7 Water Management Goal and Friant Division Improvements

Over the Five Year Vision, the SJRRP will focus on the following Water Management Goal and Friant Division Improvement actions:

- Water Management Goal Oversight – Continue overall support of the Water Management Goal and ensure individual actions are being completed efficiently and effectively. This includes the following: collaborating with the Friant Contractors to maximize water management opportunities; quarterly technical feedback meetings; facilitating and improving the recapture and recirculation of Restoration Flows, including turning over the day-to-day responsibilities to the South-Central California Area Office (SCCAO); facilitating and improving the tracking of available RWA balances, including turning over the day-to-day responsibilities to SCCAO; and, allocating RWA balances to Friant Contractors.

- Recapture and Recirculation Plan and Implementation – This includes the following: agreement between Reclamation and DWR for the recapture of Restoration Flows from the Delta; agreement, if possible, among the Friant Contractors and Westside Contractors on water supply issues related to the reduction in flood flows; completion of the Investment Strategy for addressing the portion of Paragraph 16(a) that states: *"The plan shall include provisions for funding necessary measures to implement the plan"*; and, completion of a EIS for the enhancement of recapture in the lower San Joaquin River and Delta and recirculation from San Luis Reservoir to the Friant Contractors service area. In addition, the SJRRP would implement the recommendations identified in the *2012 Post-Mortem for the Recapture and Recirculation Program* and conduct a Post-Mortem of the Recapture and Recirculation Program for 2015 Restoration Flows. Ongoing funding is included to assist in recapture and recirculation opportunities.

- Friant-Kern and Madera Canals Capacity Restoration Projects – Complete construction of the Friant-Kern and Madera Canals Capacity Restoration projects. In connection with the Friant-Kern Canal Capacity Restoration Project, Reclamation will complete the feasibility study and engineering designs in FY 2015. The Friant Water Authority is expected to provide design oversight and complete construction of the project through cooperative agreements with Reclamation. Construction is expected to start FY 2016, be fully funded in 2 years, but require up to 5 years to complete on the ground activities. In connection with the Madera Canal Capacity Restoration Project, Reclamation will continue efforts on the Demonstration Projects and award a contract for initiation of the Feasibility Study in FY 2014. The Feasibility Study is scheduled for completion in FY 2016 and construction is subject to the yet to be identified alternatives.

- Friant-Kern Canal Reverse Flow Pump-Back Project –Complete the Feasibility Study for the Friant-Kern Canal Reverse Flow Pump-Back Project. In FY 2014, Reclamation worked with the Friant Water Authority to acquire and transport the 10-50 cfs pumps from the Temporary Red Bluff Pumping Plan, and appurtenant equipment, for use by the SJRRP. This Revised Framework assumes that in FY 2017, Reclamation would initiate a Feasibility Study for the project to be completed concurrent with the Reach 4B Report to Congress required in Section 10009(f)(2) of the Settlement Act. However, in FY 2015,

the SJRRP Office of Reclamation pursued and was awarded additional funding for this project to mitigate drought effects. Therefore, this project may move forward using funds outside of the identified SJRRP needs.

- Financial Assistance for Groundwater Banking Facilities – In FY 2013, Reclamation awarded $14.29 million to four projects and provided $10 million in funding under Section 10202(a) of the Settlement Act. Within the Five Year Vision, Reclamation anticipates completing construction on these projects and allocating a minimal amount of staff time necessary to manage the agreements.

The estimated costs for Water Management Goal and Friant Division Improvement actions by year for the Five Year Vision are provided in Table 4-15.

Table 4-15. Estimated Water Management Goal and Friant Division Improvement Costs for the Five Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Water Management Goal Oversight	$1,200	$1,200	$1,200	$1,200	$1,200	$6,000
Recapture and Recirculation Plan and Implementation	$500	$500	$500	$500	$500	$2,500
Friant-Kern and Madera Canals Capacity Restoration Project	$15,080	$13,820	$100	$0	$0	$29,000
Friant-Kern Canal Reverse Flow Pump-Back Project	$250	$0	$1,000	$150	$50	$1,450
Financial Assistance for Groundwater Banking Facilities	$2,800	$10	$10	$0	$0	$2,820
Total	$19,830	$15,530	$2,810	$1,850	$1,750	$41,770

Uncertainties and possible future changes include the following:

- Friant-Kern and Madera Canals Capacity Restoration Projects – Consistent with Section 10203(a) of the Settlement Act, this project is not to exceed $35 million. It is unknown if there is a feasible project within the not to exceed amount.

4.8 Miscellaneous and/or Opportunistic Actions

Over the Five Year Vision, it is expected that some project costs may be higher than anticipated, some actions may come up at the last minute that were not included in the Framework, adaptive management actions may be needed that were not originally envisioned, and/or the Restoration Administrator may recommend some actions under Paragraph 12. Some of these actions could be solely SJRRP actions. However, there may also be some opportunities to cost share on projects that mutually benefit the SJRRP and other entities and organizations. This category

provides a small amount of funding to address these currently unknown actions. Actual activities would be determined on a year-by-year basis and would be included in the SJRRP's Annual Work Plan.

The funds allocated for Miscellaneous and/or Opportunistic Actions by year for the Five Year Vision are provided in Table 4-16, which include both Federal and State funds.

Table 4-16. Estimated Miscellaneous and/or Opportunistic Actions Funding for the Five Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 15	FY 16	FY 17	FY 18	FY 19	Total
Miscellaneous and/or Opportunistic Actions	$2,500	$2,500	$2,500	$2,500	$2,500	$12,500

This page left intentionally blank

5.0 Ten Year Vision (FY 2020 to 2024): Reach 2B Build Out

This chapter provides a description of the Ten Year Vision which begins October 1, 2019 and ends September 30, 2024. The main focus of the Ten Year Vision is building out Reach 2B of the San Joaquin River channel and awarding all remaining financial assistance for local groundwater banking projects to reduce or avoid the impacts of the Restoration Flows. Specifically, the goals of the Ten Year Vision are as follows:

1. Increase channel capacity to 4,500 cfs in Reach 2B.

2. Increase channel capacity to at least 2,500 cfs in all other reaches. This will allow for better control of water temperatures in the lower reaches during the spring pulse and reduce fish stress and mortality.

3. Complete planning and design for the Salt and Mud Slough Seasonal Barriers Project.

4. Make all major project decisions including decisions on the following projects: identify the highest priority gravel pits in Reach 1 (Paragraph 11(b)(3)); and modifications to the Chowchilla Bypass Bifurcation Structure to provide fish passage and prevent entrainment (Paragraph 11(b)(2)).

5. Acquire all land and easements for all project elements including the Reach 2B Project and the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project.

6. Construct the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project.

7. Award all remaining funding for financial assistance for local groundwater banking projects to reduce or avoid the impacts of the Restoration Flows under Public Law 111-11.

Specific actions that the Implementing Agencies intend to undertake to achieve these goals are listed below and described in more detail in the following sections:

- Program Staffing
  - Continue Program Management and Administration actions for all agencies
- Flow Actions
  - Continue actions from the Five Year Vision
  - Complete seepage and levee stability actions to allow for flows of up to 2,000 cfs in the river
- Channel and Structural Improvements

    - Construct key components of the Reach 2B levees and channel such that Reach 2B can convey up to 4,500 cfs
    - Complete land acquisition actions for the Reach 4B Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project
    - Construct the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project
    - Complete NEPA and CEQA, if determined necessary, and permitting actions for the Salt and Mud Slough Seasonal Barriers Project
- Fish Establishment
    - Continue to operate and maintain the Conservation Facility
    - Complete annual spring-run donor stock collection and tagging
    - Continue collection of wild stock
    - Continue salmon genetics monitoring
- Continue implementing the Water Management Goal and Friant Division Improvements
    - Continue Water Management Goal support actions include recapture and recirculation of Restoration Flows, tracking RWA balances, and allocating RWA water
    - Award all remaining Groundwater Banking funding

5.1 Schedule, Funding Needs and Funding Outlook

5.1.1 Schedule and Funding Need

Table 5-1 provides a summary of the schedule of the specific actions to be undertaken as part of the Ten Year Vision. Table 5-2a provides a summary of the costs and associated funding need for these actions by year for the Ten Year Vision. Tables 5-2b and 5-2c provide a summary of costs and associated funding need for Federal and State actions, respectively. As described in the Vision Approach, while activities and costs are identified by year, the Implementing Agencies recognize that activities and cost will vary from year to year and the goal is to complete all activities within the five year timeframe. This provides the year to year flexibility necessary for a program of the size, magnitude, and complexity of the SJRRP to adjust as some actions take longer or shorter than originally planned. Participation of the State will be dependent on available funds, State mandates, and the ability of the State to support the priority actions of the SJRRP with its resources.

5.1.2 Funding Outlook

From a Federal perspective, within the Ten Year Vision (FY 2020 to 2024), the SJRRP will reduce its reliance on Federal appropriations. Consistent with Section 10009(c)(2) of the Settlement Act, on October 1, 2019 or the start of Federal FY 2020, all funds deposited into the San Joaquin River Restoration Fund become available for expenditure without further appropriation. As shown in Table 5-3, it is estimated that $211,773,000 will be in the San Joaquin River Restoration Fund at the start of FY 2020. In addition, continued collections from the Friant Surcharge and Receipts from Sales of Water or Land are anticipated to result in $10,415,000 per year for the Restoration Program. In addition to these non-appropriated sources of funding, the Ten Year Vision assumes annual Federal appropriations ranging from $35 to $55 million, including $2.445 million per year in funds from the CVP Restoration Fund.

The remaining funds in the San Joaquin River Restoration Fund and the continued collections from the Friant Surcharge represent a conservative value. For planning purposes, Reclamation has assumed a long-term average Class 1 and Class 2 water sales of 800,000 acre-feet. Historically, Class 1 and Class 2 water sales have averaged 1.2 million acre-feet. Although the implementation of the Settlement would reduce Class 1 and Class 2 water sales, based on historical deliveries and anticipated releases to the river under the Settlement, it is likely that long-term average Class 1 and Class 2 water sales would be greater than 800,000 acre-feet, resulting in additional funds collected as part of the Friant Surcharge.

Additional funding for the continued participation of the State of California in the SJRRP will be needed for the State to continue its support of the Settlement. For the purposes of this planning document, it is assumed that State funding will be identified and continued participation is assumed for the Ten Year Vision. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding. A large portion of the State costs are for levee stability projects, and levee stability costs are expected to decrease.

Table 5-1. Schedule of Actions for the Ten Year Vision

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Flow-Related Activities					
Conservation Strategy and Flow-related Mitigation Measures					
Conservation Strategy					
Invasive Species Control	P	P	P	P	P
Vegetation Monitoring and Other		P	P	P	P
Re-consultation on Flows		P			P
Implement Conservation Strategy Actions for Flows	P	P	P	P	P
Channel Capacity Advisory Group (Includes Erosion Monitoring)	P	P	P	P	P
Physical Monitoring and Management Plan Implementation					
Steelhead Monitoring					
Programmatic Cultural Resources Consultation					
Millerton Lake Boat Ramps					
Traffic Detour Planning					
Sand Slough / Eastside Bypass Sand Removal					
Flow Management and Monitoring					
Daily Flow Management and Monitoring	P	P	P	P	P
Stream Gaging	P	P	P	P	P
Unexpected Seepage Losses					
Unreleased Restoration Flows	P	P	P	P	P
Restoration Flow Guidelines		P			P
Data Management	P	P	P	P	P
MAP Actions to Inform Flow Decisions	P	P	P	P	P
Water Right Annual Report	P	P	P	P	P
Seepage Actions	C	C	C	C	C
Levee Stability Actions	P	D	D	C	C
Restoration Goal Activities					
Phase I Projects					
Mendota Pool Bypass	C	O&M	O&M	D	C
Reach 2B and Chowchilla Bypass Structure Improvements	P	D	C	C	C
Reach 4B/ESB/MB Channel and Structural Improvements				D	D
Arroyo Canal Fish Screen and Sack Dam Fish Passage	D	C	O&M	O&M	O&M
Salt and Mud Slough Seasonal Barriers	P	P		P	D
Passage at Key Barriers to Migration	O&M	O&M	O&M	O&M	O&M
Phase II Projects					
Reach 4B/ESB High Flow Routing					
Chowchilla Bifurcation Structure Fish Passage					
Gravel Pit Filing and/or Isolation	P	P	P	P	P
Fisheries Re-introduction Activities					
Conservation Facility Construction (DFW cost)					
Conservation Facility Water Supply Line (Reclamation cost)					
Conservation Facility Operations and Maintenance	O&M	O&M	O&M	O&M	O&M
Donor Stock Collection	P	P	P	P	P
Trap and Haul (short-term and as needed)	P	P	P		
Genetics Monitoring	P	P	P	P	P
Segregation Actions					
Paragraph 12 Activities					
Water Management Goal and Friant Division Improvement Activities					
Water Management Goal Oversight	P	P	P	P	P
Recapture and Recirculation Activities	P	P	P	P	P
Friant-Kern and Madera Canal Capacity Restoration	O&M	O&M	O&M	O&M	O&M
Reverse Flow Facilities					
Financial Assistance for Groundwater Banking Projects	P	P	P	P	P

Notes: Cell left blank = No planned activity
P = Planning, Formulation, Environmental Compliance, Studies C = Construction
D = Design Efforts, including Final Design, Data Collection, Land Acquisition O&M = Operations and Maintenance

Table 5-2a. Summary of Costs for the Ten Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Administration and Program Management	**$8,258**	**$8,258**	**$8,258**	**$8,258**	**$8,258**
Reclamation[1]	$1,832	$1,832	$1,832	$1,832	$1,832
USFWS[2]	$1,702	$1,702	$1,702	$1,702	$1,702
NMFS[3]	$1,000	$1,000	$1,000	$1,000	$1,000
DWR	$924	$924	$924	$924	$924
DFW	$2,800	$2,800	$2,800	$2,800	$2,800
Flow-Related Activities	**$22,709**	**$24,420**	**$22,845**	**$38,347**	**$38,264**
Conservation Strategy and Flow-related Mitigation Measures	***$2,228***	***$4,200***	***$2,500***	***$3,120***	***$3,500***
Conservation Strategy					
Invasive Species Control	$300	$300	$300	$300	$300
Vegetation Monitoring & Other	$200	$200	$200	$200	$200
Re-consultation on Flows	$0	$1,500	$0	$0	$1,500
Implement Conservation Strategy Actions for Flows	$1,000	$1,500	$1,500	$1,500	$1,000
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$500	$700	$500	$1,120	$500
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$228	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$1,889***	***$2,065***	***$1,939***	***$1,538***	***$1,565***
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77
Stream Gaging	$189	$189	$189	$288	$189
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$36	$36	$36	$36	$36
Restoration Flow Guidelines	$0	$126	$0	$0	$126
Data Management	$50	$50	$50	$50	$50
MAP Actions to Inform Flow Decisions	$1,500	$1,550	$1,550	$1,050	$1,050
Water Right Annual Report	$37	$37	$37	$37	$37
Seepage Actions	***$16,141***	***$14,508***	***$14,757***	***$14,034***	***$14,498***
Levee Stability Actions (not a SJRRP cost)	***$2,451***	***$3,647***	***$3,649***	***$19,655***	***$18,701***
Restoration Goal Activities	**$24,717**	**$68,250**	**$75,614**	**$56,599**	**$50,521**
Phase I Projects[4]	***$22,645***	***$66,178***	***$73,492***	***$54,819***	***$48,741***
Mendota Pool Bypass	$220	$220	$220	$220	$5,315
Reach 2B Improvements	$21,507	$37,231	$73,247	$36,556	$12,814
Reach 4B/ESB/MB Channel and Structural Improvements	$0	$0	$0	$17,128	$29,657
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$567	$28,367	$25	$25	$25

Table 5-2a. Summary of Costs for the Ten Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Salt and Mud Slough Seasonal Barriers	$350	$360	$0	$890	$930
Passage at Key Barriers to Migration	***$0***	***$0***	***$0***	***$250***	***$250***
Phase II Projects	***$200***	***$200***	***$250***	***$250***	***$250***
Reach 4B/ESB High Flow Routing	$0	$0	$0	$0	$0
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$200	$200	$250	$250	$250
Fisheries Re-introduction Activities	***$1,872***	***$1,872***	***$1,872***	***$1,280***	***$1,280***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$700	$700	$700	$700	$700
Donor Stock Collection	$230	$230	$230	$230	$230
Trap and Haul (short-term and as needed)	$592	$592	$592	$0	$0
Genetics Monitoring	$350	$350	$350	$350	$350
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$16,700**	**$16,700**	**$8,700**	**$1,800**	**$1,800**
Water Management Goal Oversight[5]	$1,200	$1,200	$1,200	$1,200	$1,200
Recapture and Recirculation Activities	$500	$500	$500	$500	$500
Friant-Kern and Madera Canal Capacity Restoration	$0	$0	$0	$0	$0
Reverse Flow Facilities	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$15,000	$15,000	$7,000	$100	$100
Miscellaneous and/or Opportunistic Actions	**$2,700**	**$2,900**	**$3,100**	**$3,300**	**$3,500**
Total Estimated SJRRP Funding Need	**$72,633**	**$116,881**	**$114,868**	**$88,649**	**$83,642**
Levee Stability	**$2,451**	**$3,647**	**$3,649**	**$19,655**	**$18,701**
Total Estimated Funding Need	**$75,084**	**$120,528**	**$118,517**	**$108,304**	**$102,343**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.

Table 5-2b. Federal Costs for the Ten Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Administration and Program Management	**$4,534**	**$4,534**	**$4,534**	**$4,534**	**$4,534**
Reclamation[1]	$1,832	$1,832	$1,832	$1,832	$1,832
USFWS[2]	$1,702	$1,702	$1,702	$1,702	$1,702
NMFS[3]	$1,000	$1,000	$1,000	$1,000	$1,000
DWR	$0	$0	$0	$0	$0
DFW	$0	$0	$0	$0	$0
Flow-Related Activities	**$19,038**	**$19,303**	**$17,926**	**$17,302**	**$18,793**
Conservation Strategy and Flow-related Mitigation Measures	***$1,828***	***$3,600***	***$2,100***	***$2,100***	***$3,100***
Conservation Strategy					
Invasive Species Control	$300	$300	$300	$300	$300
Vegetation Monitoring & Other	$200	$200	$200	$200	$200
Re-consultation on Flows	$0	$1,500	$0	$0	$1,500
Implement Conservation Strategy Actions for Flows	$1,000	$1,500	$1,500	$1,500	$1,000
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$100	$100	$100	$100	$100
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$228	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$1,069***	***$1,195***	***$1,069***	***$1,168***	***$1,195***
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77
Stream Gaging	$119	$119	$119	$218	$119
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$36	$36	$36	$36	$36
Restoration Flow Guidelines	$0	$126	$0	$0	$126
Data Management	$50	$50	$50	$50	$50
MAP Actions to Inform Flow Decisions	$750	$750	$750	$750	$750
Water Right Annual Report	$37	$37	$37	$37	$37
Seepage Actions	***$16,141***	***$14,508***	***$14,757***	***$14,034***	***$14,498***
Levee Stability Actions (not a SJRRP cost)	***$0***	***$0***	***$0***	***$0***	***$0***
Restoration Goal Activities	**$24,477**	**$68,010**	**$75,324**	**$55,259**	**$49,181**
Phase I Projects[4]	***$22,605***	***$66,138***	***$73,452***	***$54,679***	***$48,601***
Mendota Pool Bypass	$200	$200	$200	$200	$5,295
Reach 2B Improvements	$21,487	$37,211	$73,227	$36,536	$12,794
Reach 4B/ESB/MB Channel and Structural Improvements	$0	$0	$0	$17,028	$29,557
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$567	$28,367	$25	$25	$25
Salt and Mud Slough Seasonal Barriers	$350	$360	$0	$890	$930
Passage at Key Barriers to Migration	$0	$0	$0	$0	$0

Table 5-2b. Federal Costs for the Ten Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Phase II Projects	***$0***	***$0***	***$0***	***$0***	***$0***
Reach 4B/ESB High Flow Routing	$0	$0	$0	$0	$0
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$0	$0	$0	$0	$0
Fisheries Re-introduction Activities	***$1,872***	***$1,872***	***$1,872***	***$580***	***$580***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$700	$700	$700	$0	$0
Donor Stock Collection	$230	$230	$230	$230	$230
Trap and Haul (short-term and as needed)	$592	$592	$592	$0	$0
Genetics Monitoring	$350	$350	$350	$350	$350
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$16,700**	**$16,700**	**$8,700**	**$1,800**	**$1,800**
Water Management Goal Oversight[5]	$1,200	$1,200	$1,200	$1,200	$1,200
Recapture and Recirculation Activities	$500	$500	$500	$500	$500
Friant-Kern and Madera Canal Capacity Restoration	$0	$0	$0	$0	$0
Reverse Flow Facilities	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$15,000	$15,000	$7,000	$100	$100
Miscellaneous and/or Opportunistic Actions	**$2,200**	**$2,400**	**$2,600**	**$2,800**	**$3,000**
Total Estimated Federal Funding Need	**$66,949**	**$110,947**	**$109,084**	**$81,695**	**$77,308**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.
6.

Table 5-2c. State Costs for the Ten Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Administration and Program Management	**$3,724**	**$3,724**	**$3,724**	**$3,724**	**$3,724**
Reclamation[1]	$0	$0	$0	$0	$0
USFWS[2]	$0	$0	$0	$0	$0
NMFS[3]	$0	$0	$0	$0	$0
DWR	$924	$924	$924	$924	$924
DFW	$2,800	$2,800	$2,800	$2,800	$2,800
Flow-Related Activities[5]	**$3,671**	**$5,117**	**$4,919**	**$21,045**	**$19,471**
Conservation Strategy and Flow-related Mitigation Measures	***$400***	***$600***	***$400***	***$1,020***	***$400***
Conservation Strategy	$0	$0	$0	$0	$0
Invasive Species Control	$0	$0	$0	$0	$0
Vegetation Monitoring & Other	$0	$0	$0	$0	$0
Re-consultation on Flows	$0	$0	$0	$0	$0
Implement Conservation Strategy Actions for Flows	$0	$0	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$400	$600	$400	$1,020	$400
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$0	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$820***	***$870***	***$870***	***$370***	***$370***
Daily Flow Management and Monitoring	$0	$0	$0	$0	$0
Stream Gaging	$70	$70	$70	$70	$70
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$0	$0	$0	$0	$0
Restoration Flow Guidelines	$0	$0	$0	$0	$0
Data Management	$0	$0	$0	$0	$0
MAP Actions to Inform Flow Decisions	$750	$800	$800	$300	$300
Water Right Annual Report	$0	$0	$0	$0	$0
Seepage Actions	**$0**	**$0**	**$0**	**$0**	**$0**
Levee Stability Actions	***$2,451***	***$3,647***	***$3,649***	***$19,655***	***$18,701***
Restoration Goal Activities	**$240**	**$240**	**$290**	**$1,340**	**$1,340**
Phase I Projects[4]	***$40***	***$40***	***$40***	***$140***	***$140***
Mendota Pool Bypass	$20	$20	$20	$20	$20
Reach 2B Improvements	$20	$20	$20	$20	$20
Reach 4B/ESB/MB Channel and Structural Improvements	$0	$0	$0	$100	$100
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$0	$0	$0	$0	$0
Salt and Mud Slough Seasonal Barriers	$0	$0	$0	$0	$0
Passage at Key Barriers to Migration	**$0**	**$0**	**$0**	***$250***	***$250***

Table 5-2c. State Costs for the Ten Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 20	FY 21	FY 22	FY 23	FY 24
Phase II Projects	***$200***	***$200***	***$250***	***$250***	***$250***
Reach 4B/ESB High Flow Routing	$0	$0	$0	$0	$0
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$200	$200	$250	$250	$250
Fisheries Re-introduction Activities	***$0***	***$0***	***$0***	***$700***	***$700***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$0	$0	$0	$700	$700
Donor Stock Collection	$0	$0	$0	$0	$0
Trap and Haul (short-term and as needed)	$0	$0	$0	$0	$0
Genetics Monitoring	$0	$0	$0	$0	$0
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$0**	**$0**	**$0**	**$0**	**$0**
Water Management Goal Oversight[5]	$0	$0	$0	$0	$0
Recapture and Recirculation Activities	$0	$0	$0	$0	$0
Friant-Kern and Madera Canal Capacity Restoration	$0	$0	$0	$0	$0
Reverse Flow Facilities	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$0	$0	$0	$0	$0
Miscellaneous and/or Opportunistic Actions	**$500**	**$500**	**$500**	**$500**	**$500**
Total Estimated State Funding Need	**$8,135**	**$9,581**	**$9,433**	**$26,609**	**$25,035**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.

Table 5-3. San Joaquin River Restoration Funds Available in FY 2020 Not Subject to Appropriations

Funding Source	Total Anticipated Funding Available
Friant Capital Repayment (1)	$217,082,000
Friant Surcharge (2)	$58,854,000
Receipts from Sales of Water or Land	$48,422,000
$88 Million Expended not Subject to Appropriations	($88,000,000)
Friant-Kern and Madera Canal Improvements not Subject to Appropriations	($35,000,000)
Total	**$211,773,000**

Notes:

1. Estimated based on capital repayment to date, negotiated repayment contacts, and anticipated repayment amounts prior to negotiated repayment contracts along with anticipated amounts from the contractors that did not execute repayment contracts.
2. Assumes long-term average Class 1 and Class 2 water sales of 800,000 acre-feet. Includes actual collections from FY 2010 to 2014. Future collections are estimated at $5.6 million per year until FY 2019.

5.2 Responsible Implementing Agency

Table 5-4 provides a summary of the Implementing Agency responsible for carrying out the activities in the Ten Year Vision.

Table 5-4. Implementing Agency Leads in the Ten Year Vision

Action	Lead Implementing Agency
Program Staffing	
Federal Agencies	Reclamation will continue to provide funding for Reclamation, USFWS, and NMFS program staffing functions. However, it is expected the USFWS and NMFS consider ways to fund these activities with their own funds.
State Agencies	The State agencies will continue to provide funding for their program staffing functions.
Flow Actions	
Conservation Strategy and Flow-related Mitigation Measures	
Conservation Strategy - Invasive Species Control	Reclamation
Conservation Strategy – Re-consultation on Flows	Reclamation, with technical assistance from NMFS and USFWS
Conservation Strategy – Implement Flow Actions	Reclamation
Channel Capacity Advisory Group (includes Erosion Monitoring)	Reclamation, with technical assistance from DWR (at DWR's own cost)
Physical Monitoring and Management Plan	Reclamation, with technical assistance from DWR (at DWR's own cost)
Flow Management and Monitoring	
Daily Flow Management and Monitoring	Reclamation

Table 5-4. Implementing Agency Leads in the Ten Year Vision

Action	Lead Implementing Agency
Stream Gaging	Reclamation and DWR
Unexpected Seepage Losses	Reclamation
Unreleased Restoration Flows	Reclamation
Restoration Flow Guidelines	Reclamation
Data Management	Reclamation
MAP Actions to Inform Flow Decisions	Reclamation, DWR, and DFW
Water Right Compliance and Annual Report	Reclamation
Seepage, Levee Stability, and Flowage Easement	
Seepage	Reclamation
Levee Stability	DWR
Flowage Easements	Reclamation
Channel and Structural Improvements	
Reach 2B Levee Construction	Reclamation
Reach 4B Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project Land Acquisition and Final Design	Reclamation and DWR (each agency will cover their own staff costs and will share in design costs)
Arroyo Canal Fish Screen and Sack Dam Fish Passage Construction	Reclamation
Salt and Mud Slough Barriers Project	Reclamation
Fish Establishment	
Operation of the Conservation Facility	Reclamation and DFW
Spring-run Donor Stock Collection	USFWS and DFW
Genetics Monitoring	Reclamation and DFW
Segregation Actions	USFWS
Issue Annual Technical Memorandum pursuant to 10(j) and 4(d) Rule Package	NMFS
Water Management Goal and Friant Division Improvement Actions	
Recapture, Recirculation and Tracking / Allocating RWA water	Reclamation
Recapture and Recirculation Plan	Reclamation
Recirculation EIS	Reclamation
Manage Part III Funds and Projects	Reclamation

5.3 Program Staffing and Administration

Program staffing and administration includes a wide array of activities including funding for Reclamation, USFWS and NMFS program wide-related activities and administration and program-wide public and landowner outreach as described in Section 4.3.

Program staffing and administration includes program-wide activities including funding for DWR program-wide actions, training, overhead, supervising, and administrative activities as described in Section 4.3.

The estimated costs for staffing and administration for the Ten Year Vision are provided in Table 5-5. Staffing and administration is an ongoing annual activity and the costs are reflecting of this.

Table 5-5. Estimated Program Staffing and Administration Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Reclamation	$1,832	$1,832	$1,832	$1,832	$1,832	$9,160
USFWS	$1,702	$1,702	$1,702	$1,702	$1,702	$8,510
NMFS	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000
DWR	$924	$924	$924	$924	$924	$4,620
DFW	$2,800	$2,800	$2,800	$2,800	$2,800	$14,000
Total	$8,258	$8,258	$8,258	$8,258	$8,258	41,290
Notes: Reclamation covers the cost for Reclamation, USFWS, and NMFS program staffing and administration costs. DWR and DFW cover their costs for program staffing and administration.						

5.4 Flow Actions

Flow actions are described in Section 4.4. The Ten Year Vision generally includes the same actions as the Five Year Vision. However, the Ten Year Vision includes addressing the seepage and levee stability commitments made in the PEIS/R ROD to allow for flows of up to 2,000 cfs in the river. The flow-related actions that are expected to occur in the Ten Year Vision are described below.

5.4.1 Conservation Strategy and Flow-related Mitigation Measures

Conservation strategy and flow-related mitigation measures and environmental commitments include the actions and commitments identified in the PEIS/R ROD related to flows. Specifically, within the Ten Year Vision, this includes the following:

- Conservation Strategy – See Section 4.4.1 for a description of the Conservation Strategy. Specifically, within the Ten Year Vision the following project-level action are anticipated:
    - Invasive Species Control – Conservation Measure INV-1 includes the implementation of the Invasive Vegetation Monitoring and Management Plan for the SJRRP (Appendix L of the Draft PEIS/R), which includes measures to monitor, control, and where possible eradicate, invasive plant infestations during flow releases.
    - Vegetation Monitoring and Other – Conservation Measure RHSNC-1 requires development and implementation of the Riparian Habitat Mitigation and Monitoring Plan. The draft Riparian Habitat Mitigation and Monitoring Plan requires updating of the riparian habitat map every 2-5 years. In addition, the Physical Monitoring and Management Plan requires routine transect monitoring following peak flow events.
    - Re-consultation on Flows – Consistent with the Biological Opinions issued by NMFS and USFWS, Reclamation will need to reconsult periodically to increase Restoration Flow releases. In preparation for increased Restoration Flow releases in the Ten Year Vision and for additional increases in the Fifteen Year Vision, this Ten Year Vision includes two re-consultation efforts on flows.

  - Implement Conservation Strategy Actions for Flows Above 1,660 cfs Release – In general, the PEIS/R ROD recognized that limited data was available to determine the impacts of flows above a 1,660 cfs release from Friant Dam and therefore, there was limited ability to determine the potential impacts to species and habitat from these higher releases. To address this, the Conservation Strategy included a series of monitoring, data collection, and analysis efforts. This action includes implementing these efforts along with an assumed amount of avoidance, minimization and mitigation measures to address the potential impacts of higher flow releases on species and habitats.

- Channel Capacity Advisory Group – This action is described in Section 4.4.1 and would be a continuation of the same actions in the Five Year Vision. Actual actions to improve channel capacity are identified under the Section 5.4.3, Seepage and Levee Stability, and Section 5.5, Channel and Structural Improvements.

- Physical Monitoring and Management Plan – This action is described in Section 4.4.1. The flow monitoring component is addressed in Section 5.4.2, Flow Management and Monitoring. The groundwater seepage component is address in Section 5.4.3, Seepage and Levee Stability. The channel capacity component is addressed in the bullet above and in Section 5.4.3, Seepage and Levee Stability. For the same reasons as described in the Five Year Vision, no actions would be implemented in the Ten Year Vision.

- Steelhead Monitoring – This action is described in Section 4.4.1. As flow continuity and fish passage are generally provided in the Five Year Vision, habitat would be accessible for steelhead. The steelhead monitoring will be implemented from the time the Hills Ferry Barrier is removed each year (approximately December 1) through March 15, as needed and in coordination with NMFS. With completion of the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project, no monitoring will be needed. This is expected to occur as part of the Ten Year Vision.

The estimated costs for the conservation strategy and flow-related mitigation measures and environmental commitments for the Ten Year Vision are provided in Table 5-6.

Uncertainties and possible future changes the conservation strategy and flow-related mitigation measures and environmental commitments for the Ten Year Vision include the following:

- Conservation Strategy – Re-consultation on Flows – The level of effort for this is generally unknown at this time. Costs assume some modeling and analysis.

- Conservation Strategy – Implement Conservation Strategy Actions for Flows Above 1,660 cfs Release – The actual data needs, level of analysis and avoidance, minimization and mitigation measures to address the potential impacts of higher flow releases on species and habitats are unknown at this time. Costs are general estimates and will change as more information is known.

- Channel Capacity Advisory Group (includes Erosion Monitoring) – The amount of erosion management actions is unknown at this time and costs are general estimates that are likely to change.

- Cultural Resources – As described in Section 4.4.1., long-term preservation costs are not included, but may be necessary if any preservation of resources is determined necessary.

Table 5-6. Estimated Conservation Strategy and Flow-related Mitigation Measures Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Invasive Species Control	$300	$300	$300	$300	$300	$1,500
Vegetation Monitoring & Other	$200	$200	$200	$200	$200	$1,000
Re-consultation on Flows	$0	$1,500	$0	$0	$1,500	$3,000
Implement Conservation Strategy Actions for Flows	$1,000	$1,500	$1,500	$1,500	$1,000	$6,500
Channel Capacity - Federal	$100	$100	$100	$100	$100	$500
Channel Capacity - State	$400	$600	$400	$1,020	$400	$2,820
Steelhead Monitoring	$228	$0	$0	$0	$0	$228
Total	$2,228	$4,200	$2,500	$3,120	$3,500	$15,485
Notes: All costs are Federal costs unless otherwise noted.						

5.4.2 Flow Management and Monitoring

Flow management and monitoring actions in the Ten Year Vision are the same as and a continuation of those in the Five Year Vision. See Section 4.4.2 for a description of these actions.

Similar to the Five Year Vision, no acquisition of Unexpected Seepage Loss water is anticipated and no funding is allocated to this effort. Reclamation may be able to acquire water for Unexpected Seepage Loss through management of Unreleased Restoration Flows (some labor costs would be needed to facilitate these agreements). However, the amount acquired will be opportunistic and will depend greatly on hydrology, Unreleased Restoration Flows, and the ability to find mutually agreeable terms with the Friant Division long-term contractors to enter into such agreements.

The Ten Year Vision also assumes that some revisions to the Restoration Flow Guidelines will be necessary. The estimated costs for these flow actions for the Ten Year Vision are provided in Table 5-7.

Table 5-7. Estimated Flow Management and Monitoring Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77	$385
Stream Gaging[1]	$189	$189	$189	$288	$189	$1,044
Federal	$119	$119	$119	$218	$119	$694
State	$70	$70	$70	$70	$70	$350
Unexpected Seepage Losses	$0	$0	$0	$0	$0	$0
Unreleased Restoration Flows[2]	$36	$36	$36	$36	$36	$180
Restoration Flow Guidelines[3]	$0	$126	$0	$0	$126	$252
Data Management[4]	$50	$50	$50	$50	$50	$250
MAP Actions to Inform Flow Decisions[5]	$1,500	$1,550	$1,550	$1,050	$1,050	$6,700
Federal	$750	$750	$750	$750	$750	$3,750
State	$750	$800	$800	$300	$300	$2,950
Water Right Compliance and Annual Report	$37	$37	$37	$37	$37	$185
Total	$1,889	$2,065	$1,939	$1,538	$1,565	$8,996

Notes: All costs are Federal costs unless otherwise noted.

1. Assumes operations and maintenance, quality control of data, and replacement of key parts on an approximately 5 year basis.
2. Assumes staff time to identify opportunities and enter into agreements to manage Unreleased Restoration Flows. Costs held constant and with increased channel capacity over time, there will be less Unreleased Restoration Flows to manage.
3. Assumes revisions to the Restoration Flow Guidelines approximately every 3 years.
4. Annual data entry.
5. MAP studies and monitoring actions includes only those actions necessary for flow management and monitoring and making flow decisions. Additional MAP studies may be funded through other Program actions, such as Channel and Structural Improvement Projects and Fish Establishment Actions.

Uncertainties and possible future changes in Flow Management and Monitoring Actions include the following:

- Unexpected Seepage Losses and Unreleased Restoration Flows – While Reclamation can develop cost-neutral banking, storing, exchange, transfer, and sale on water and options for specific quantities, the ability to reach the quantities called for in the Settlement is unknown.

- Restoration Flow Guidelines – Costs will vary depending on the number of revisions in the future.

- Data Management – These costs may vary over time with changes in Reclamation policies, stakeholder requirements, and new and / or improved software development.

- MAP Actions to Inform Flow Decisions – The MAP studies and monitoring actions will vary year-to-year depending upon the information needs, opportunities provided by hydrology and fisheries information needs. It is assumed that costs would not exceed those identified above, but they may be less. MAP information needs in this Ten Year

Vision include any studies needed to make a decision regarding the Chowchilla Bifurcation structure for fish passage.

5.4.3 Seepage and Levee Stability

Seepage and levee stability includes the actions necessary to meet the commitments in the PEIS/R ROD to release flows in a way that does not result in material adverse impacts to adjacent agricultural lands from seepage or result in material adverse impacts to levee stability. Below are the groundwater seepage and levee stability actions anticipated in the Ten Year Vision.

- Groundwater Seepage – Groundwater seepage concerns are described in Section 4.4.3. During the Ten Year Vision, properties adjacent to the Eastside Bypass, in Reach 4A, Reach 3, and Reach 2A may experience groundwater seepage concerns at flows of up to 2,500 cfs. Interceptor lines, seepage easements, fee-simple acquisition, or other physical projects such as slurry walls or drainage ditches would be constructed to allow up to 2,500 cfs of Restoration Flows without groundwater seepage impacts. Reclamation anticipates completing seepage projects to allow flows up to 2,500 cfs by 2022.

- Levee Stability – Levee stability concerns are described in Section 4.4.3. During the Ten Year Vision, DWR anticipates the levee remediation work to allow flows up to 2,500 cfs could be done if funding is available.

The groundwater seepage projects for properties potentially impacted between 1,300 cfs and 2,500 cfs and estimated costs for seepage projects to address these properties for the Ten Year Vision are provided in Table 5-8. For groundwater seepage, cost estimates were developed for interceptor lines, fee-simple acquisition, and seepage easements. It is assumed that interceptor lines cost $488 per linear foot, based on preliminary designs from Reclamation's contractor including construction and operations and maintenance costs into the future. The high end of the 2013 Land Trends of the California Chapter of the American Society of Farm Managers and Rural Appraisers was used to estimate fee-simple acquisition, based on each property's county, crop type, and water supply (ASFMRA, 2013). Seepage easements were estimated at 60 percent of fee-title based on appraisals conducted by Reclamation to date. Environmental compliance ($30,000 each), appraisal ($20,000 each), and cultural resources costs (depending on likelihood, $5,500 per mile to $175,000 for the property) were also included.

The levee remediation projects address levee stability issues where the water surface elevation of Restoration Flows between 1,300 cfs and 2,500 cfs exceeds 1 feet above the levee toe based on preliminary geotechnical investigations and hydraulic modeling by DWR. In the Middle Eastside Bypass, the exception, the levee remediation projects address levee stability issues where the water surface elevation at Restoration Flows between 1,300 cfs and 2,500 cfs is more than 2 feet higher than the outside levee toe. Estimated costs to address these areas for the Ten Year Vision are provided in Table 5-9. This unit cost is based on the average linear foot cost of interceptor lines from preliminary designs by Reclamation's groundwater seepage contractor, including construction and operations and maintenance costs. The unit costs for the slurry walls are based on recommendations from DWR's Division of Flood Management and are $1,800 per linear foot. Slurry wall costs are used in the totals as a conservative (i.e., high) cost, although drains may be constructed in some locations instead.

Table 5-8. Groundwater Seepage Projects and Estimated Costs for Properties Impacted Between 1,300 cfs and 2,500 cfs

Reach	Impacted Area (acres)	Estimated Cost
2A	1,200	$10,356,000
2B	388	$3,919,000*
3	2,172	$27,633,000
4A	3,712	$22,635,000
Eastside Bypass	0	$0
5	0	$0
Total	**7,472**	**$64,543,000**

Notes:

* These costs are not included in the total, as these properties have to be purchased for the Mendota Pool Bypass and Reach 2B Project, and therefore, the costs are included under that project.

Table 5-9. Levee Remediation to Address Levee Stability Issues where between 1,300 cfs and 2,500 cfs Exceeds 1 feet above Levee Toe or 2 feet above the Toe in the Middle Eastside Bypass

Reach	Impacted Left Levee Length (feet)	Impacted Right Levee Length (feet)	Total Impacted Levee Length (feet)	Total Cost of Remediation with Toe Drains	Total Cost of Remediation with Slurry Walls
2A	0	310	310	$151,000	$558,000
3	0	1,340	1,340	$654,000	$2,412,000
4A	860	1,160	2,010	$981,000	$3,618,000
5 (all)	0	0	0	$0	$0
Middle Eastside Bypass	13,840	9,040	22,880	$11,165,440	$41,184,000
Lower Eastside Bypass	0	0	0	$0	$0
Total	**14,700**	**11,850**	**26,540**	**$12,951,440**	**$47,772,000**

The estimated costs for the seepage and levee stability actions by year, for the Ten Year Vision, are provided in Table 5-10. Note that for seepage these include additional efficiencies – projects to get flows beyond 2,500 cfs but that are the same landowners as projects to get flows to 2,500 cfs. This results in the table below not matching above tables by reach.

Table 5-10. Estimated Seepage and Levee Stability Costs for the Ten Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Seepage	$16,141	$14,508	$14,757	$14,034	$14,498	$73,938
Levee Stability (State lead)	$2,451	$3,647	$3,649	$19,655	$18,701	$48,103
Total	$18,592	$18,155	$18,406	$33,689	$33,199	$122,041

Notes: All costs are Federal costs unless otherwise noted. State costs are uncertain due to lack of State funding past 2017.

Uncertainties and possible future changes in seepage and levee stability actions include the following:

- Levee stability information will improve as DWR finishes geotechnical data reports and it is likely that the levee costs included herein will reduce due to greater knowledge of levee soils and stability. However, subsidence information has not been included in the analysis to date and could reduce channel capacities and increase areas needing levee work. Levee costs are highly uncertain at this time.

- Levee improvements do not consider the Reach 4B routing decision. Costs above area based on routing flow and fish through the Eastside Bypass to the San Joaquin River. If the Mariposa Bypass is used, costs will change. Spending funds in the Eastside Bypass in the short term to allow higher flows, when the permanent route could be different, will be challenging.

5.5 Channel and Structural Improvements

The following are the channel and structural improvements actions anticipated in the Ten Year Vision:

- Construct key components of the Reach 2B levees and channel such that Reach 2B can convey up to 4,500 cfs

- Complete land acquisition for the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project

- Construct the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project

- Complete environmental compliance and permitting actions for the Salt and Mud Slough Seasonal Barriers Project

These actions are described in more detail below.

5.5.1 Reach 2B Levees

The expansion of Reach 2B to convey 4,500 cfs is anticipated to be constructed in the Ten Year Vision. This would allow for additional Restoration Flow releases into the San Joaquin River channel, up to the flow constraints presented by seepage and levee stability challenges. The expansion of Reach 2B would involve the construction of setback levees, relocating existing facilities, and some floodplain grading and revegetation. Floodplain grading and revegetation could be a substantial cost. During this Ten Year Vision, some land would be regraded for floodplain habitat and seed banks would be added to add native vegetation. However, some land may be acquired by the government and then then leased or rented back to growers to continue to farm or graze within the floodplain. This allows floodplain grading and revegetation to occur over a longer period, minimizes the growth of invasive plants due to farming operations, retains a land management entity, and reduces the amount of agricultural land taken out of production at one time. Over the long term, more of this land may be converted to floodplain habitat, or

agreements may be reached with growers to create multiple use properties managed for habitat uses while allowing farming to continue.

DWR appraisal level designs from 2011 are used for the purposes of the cost estimate in this Revised Framework, after indexing to April 2015 price levels using the Building Construction Index. However, the floodplain revegetation costs were divided in half due to Reclamation's different approach of seed banks and more passive restoration, allowing vegetation to reach ideal conditions over several years. In addition, Reach 3 levee protection is not needed in Reclamation's design and these costs are not included.

For the purposes of the cost estimate in this Revised Framework, Alternative B, the alternative identified as the Preferred Alternative in the Mendota Pool Bypass and Reach 2B Channel Improvements Project Draft EIS/R, is assumed. However, the use of this alternative for costing purposes in this Revised Framework does not represent a final agency decision or final selection of this alternative – the final agency decision will continue to be made through the joint NEPA/CEQA process that is currently underway.

Necessary components of expanding Reach 2B include the following:

- Land Acquisition, estimated at $37.21 million – This allows for the setback levees to be built by acquiring the land for levees and floodplain. Acquisitions will occur early in the Ten Year Vision, or potentially in the Five Year Vision for some parcels. Land acquisition costs are based on the average values in the 2014 Land Trends of the California Chapter of the American Society of Farm Managers and Rural Appraisers report for Madera and Fresno counties, for the appropriate crop type. These are order of magnitude estimates as appraisals have not been completed.

- Reach 2B setback levees, estimated at $88.55 million – Setback levees are required to increase the capacity of the Reach 2B channel to convey 4,500 cfs.

- Various pump and utility relocations, estimated at $21.49 million – Pump and utility relocations for the Mowry pumps, City of Mendota groundwater wells, private wells, electrical lines, and similar that would need to be relocated out of the floodplain or otherwise adjusted.

- Bend 10 Revetment, estimated at $21.22 million – Revetment is needed near several bends where the Columbia Canal is very close to the river channel, confining the extent of the setback levee and forcing the river close to the levee toe, increasing erosion and requiring bank protection.

- Floodplain grading, estimated at $12.79 million – Floodplain grading involves primarily breaking existing levees to allow floodplain inundation and minor side-channel creation. Extensive re-grading is not considered at this time.

- Compact Bypass Fish Passage (for low flows only), estimated at $5.29 million – When the Compact Bypass Bifurcation Structure gates are nearly or completely closed (i.e., in the rare instance when deliveries are being made to the Exchange Contractors in Mendota

Pool), fish may not be able to pass through the bifurcation structure. This facility would be a low-flow fish ladder with supplemental flow to meet fish passage criteria. Maximum flow is 125 cfs through the ladder, and a supplemental attraction flow of 325 cfs is provided to meet criteria.

- San Joaquin River Bifurcation Structure near the Chowchilla Bypass Fish Passage, estimated at $8.22 million – This includes a fish ladder with supplemental flow to allow fish passage over the Bifurcation Structure. Similar to the Compact Bypass fish ladder, this structure has a maximum flow of 125 cfs that is supplemented at the bottom of the ladder as an attractant flow. This action may be undertaken by DWR if funds are available.

- Operations and Maintenance, estimated at $200,000 per year – While the long-term O&M entities are unknown, Reclamation has budgeted this for long term O&M.

The estimated costs by year, for the Ten Year Vision, are provided in Table 5-11.

Table 5-11. Estimated Reach 2B Levee Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Compact Bypass O&M	$200	$200	$200	$200	$5,295	$6,095
Reach 2B Levee Expansion	$21,487	$37,211	$73,227	$36,536	$12,794	$181,255
DWR Support (State Cost)	$40	$40	$40	$40	$40	$200
Notes: All Reach 2B levee expansion costs are Federal costs. If State funds are available, DWR may undertake the fish passage improvements to the San Joaquin River Structure at the Chowchilla Bypass. State costs are for both Reach 2B levees and Mendota Pool Bypass.						

Uncertainties and possible future changes include the following:

- For the purposes of the cost estimate in this Revised Framework, it is assumed that the consensus based levee alignment is the constructed alternative to address the requirements in the Settlement. If another alternative is selected, costs will change.

- Future Value Engineering studies could result in cost reduction ideas.

- Schedules and costs represent costs for Federal projects. Local knowledge and partnership could reduce costs or schedules.

5.5.2 Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project

Reach 4B1 is a section of river that has remained largely unmaintained and unused for flow routing, which appears to be contrary to the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project (The Reclamation Board 1967). Headgates at the top of Reach 4B1 prevent flows from entering this section of the river. It generally carries agricultural

return and local water deliveries. Channel capacities have been significantly reduced by vegetation and the installation of road crossings and other obstructions. Although Reach 4B1 was designed to carry 1,500 cfs when the Flood Control Project was constructed, the current conveyance capacity of Reach 4B1 may be as little as zero in some locations.

Activities to be completed within the Ten Year Vision include final design and land acquisition for the Reach 4B project as follows:

- Final Design and data collection, estimated at $2.8 million – This includes geotechnical investigations for informing foundation and levee design, as well as Reclamation's engineering costs.

- Land Acquisition, estimated at $37,589,000 – Lands would allow for expansion of the Reach 4B1 river channel to 475 cfs or 4,500 cfs depending on the alternative, or to allow setback levees on the Eastside Bypass if a bypass alternative is selected. Land acquisition costs are averaged across all alternatives.

As the project is in the early design stages, land acquisition costs are an assumed amount and are not based on any particular alternative or levee alignment. The estimated costs by year, for the Ten Year Vision, are provided in Table 5-12.

Table 5-12. Estimated Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project Costs for the Ten Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Reach 4B Design and Land Acquisition	$0	$0	$0	$17,028	$29,557	$46,585
DWR Support (State Cost)	$0	$0	$0	$100	$100	$200
Notes: Reach 4B Design costs may include some State costs for Eastside Bypass or Reach 4B1 levees, responsibilities as yet uncertain.						

The responsibilities for levee design and construction costs as part of the Reach 4B project are unknown at this time. Current thinking is that DWR will construct levees on flood control facilities, such as the Eastside Bypass levees, to the extent needed to increase capacity to the level required in the Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project (The Reclamation Board 1967). State costs identified in Table 5-12 above do not include design costs. DWR funding beyond 2017 is currently uncertain and as such responsibilities will need to be verified.

Uncertainties and possible future changes include the following:

- Final design and land costs are likely to vary substantially depending on the alternative selected. There is simply not enough information to accurately determine these at this time.

- There are a series of local, State, and Federal agencies that have flood conveyance responsibilities in Reach 4B1 including the Lower San Joaquin Levee District, the Central Valley Flood Protection Board, and the U.S. Army Corps of Engineers. If improvements are made to the Reach 4B1 channel, the relevant agencies would need to work together to identify and resolve outstanding issues including design standards, operations and maintenance responsibilities, consistency with the Federal authorization and commitments made for the Flood Control Project (if any exist), and potential sources of funding to make such improvements.

5.5.3 Arroyo Canal Fish Screen and Sack Dam Fish Passage Project

The Arroyo Canal Fish Screen will prevent fish being entrained into Arroyo Canal. The Sack Dam fish passage structure will allow anadromous fish to pass upstream and downstream of the structure. During the Ten Year Vision, the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project will go through final design and construction. Components include:

- Demolition of the existing Sack Dam structure;
- Construction of a new Sack Dam to accommodate fish passage, along with improved stability for the east abutment;
- Fish ladder and transport channel to convey downstream and upstream migrating fish past Sack Dam;
- Fish screen / barrier within Arroyo Canal;
- Trash-rack structure and log boom at the head of Arroyo Canal with automatic raking mechanism;
- Control building to accommodate mechanical, electrical, and instrumentation and control equipment, along with an equipment storage building; and,
- Replace existing bridge across Poso Canal and construct a new bridge to accommodate O&M equipment.

The estimated costs by year for the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project in the Ten Year Vision are provided in Table 5-13. Costs are from the 60% design cost estimates and packages developed by CH2M Hill under contract to Henry Miller Reclamation District #2131, the project CEQA lead, and then indexed to April 2015 using the same Building Cost Index used for indexing SJRRP construction projects throughout this document. Costs include design and data collection costs at 2 percent of the total construction cost in FY 2020, followed by construction cost – including operations and maintenance equipment – in FY 2021.

Table 5-13. Estimated Arroyo Canal Fish Screen and Sack Dam Fish Passage Project Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Arroyo Canal and Sack Dam Project	$567	$28,367	$25	$25	$25	$29,009

Uncertainties and possible future changes include the following:

- Subsidence is a major uncertainty for this project. The design may need to change to accommodate subsidence and change the existing gravity diversion to a pumped diversion structure. While the SJRRP does not pay for a new diversion structure and did not cause subsidence, cost increases could occur to re-design the project around new facilities required by subsidence.

- Final fish passage design criteria will have a large effect on structure costs. Factors which can greatly increase costs include whether fish require raised roadways, passage protection during flood flows, elimination of upstream backwater conditions, sturgeon passage, upstream juvenile salmon passage, or passage for other native fishes.

- Future Value Engineering studies could result in cost reduction ideas.

- Schedules and costs represent costs for Federal projects. Local knowledge and partnership could reduce costs or schedules.

5.5.4 Salt and Mud Slough Seasonal Barriers Project

Salt and Mud sloughs represent potential false migration pathways for adult salmon. The amount of water coming out of these sloughs, along with past observations of fall-run Chinook straying into Salt and Mud sloughs, suggest that migrating salmon could be attracted into them. The percentage of adult fish that would stray into these sloughs, and the fate of those that do, is not known at this time. However, Paragraph 11(a)(10) of the Settlement calls for enabling the deployment of seasonal barriers at both Salt and Mud sloughs to prevent adult anadromous fish from entering the false migration pathways. Barriers would prevent fish from entering these sloughs and potential loss of fish would be avoided.

Although fish barriers are proposed to be deployed near the Salt and Mud sloughs, uncertainty exists whether the barriers are required once full Restoration Flows can be conveyed in the river. At present, most salmon entering the San Joaquin River make their way up Salt and Mud sloughs. However, there is no flow in the San Joaquin River and salmon may be attracted to the sloughs as these are the only flowing waterways in the area. It is unclear if the stray rate into the sloughs will be similar in the future once flows are restored to the river channel. Therefore, this Ten Year Vision includes a study to determine the rate of strays into the sloughs once substantial flows are able to be conveyed in the river. A specific study plan is unknown at this time and a general cost is assumed. However, it is assumed that the study is conducted in both the spring and fall to determine if the stray rates are different for returning spring-run and fall-run adults.

Assuming that the study effort determines that barriers are needed, planning, environmental compliance and design activities are assumed to begin in FY 2023.

The estimated costs for the Salt and Mud Slough Seasonal Barriers Project are provided in Table 5-14.

Table 5-14. Estimated Salt and Mud Slough Seasonal Barriers Project Costs for the Ten Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Study Effort [1]	$350	$360	$0	$0	$0	$710
Planning, Design, and Environmental Compliance	$0	$0	$0	$890	$930	$1,820
Total	$350	$360	$0	$890	$930	$2,530

Notes: All costs are assumed to be Federal costs.

1. Assumes studies efforts occur in both spring and fall to determine if stray rates are different for returning spring-run and fall-run adults.

Uncertainties and possible future changes in the Salt and Mud Slough Seasonal Barriers Project include the following:

- Costs are general estimates at this time as little information is known on where the barriers would be located and design considerations. Costs also assume a seasonal barrier-type structure. A more permanent structure would increase costs.

- The scope of this project may change substantially based on the study efforts.

5.6 Fish Establishment

Over the Ten Year Vision, the SJRRP will focus on the following Fish Establishment actions:

- Operation of the Conservation Facility – DFW will continue to operate the Conservation Facility. Funding is anticipated to be provided by Reclamation for the operations of these facilities through June 30, 2022, subject to Federal appropriations and executed funding agreements.

- Spring-run Donor Stock Collection – USFWS and DFW will complete annual spring-run donor stock collection and tagging consistent with the Section 10(a)(1)(A) permits issued by NMFS. This action will result in ongoing inputs into the broodstock and in-river populations. During the Ten Year Vision, this action will continue with (if started in the Five Year Vision) or be expanded to include the collection of wild spring-run stock for broodstock. Collection actions will be conducted consistent with the permit issued by NMFS in the Five Year Vision and may not be completed every year.

- Genetics Monitoring – The SJRRP will continue genetic analysis for spring-run and fall-run. As donor stock is expanded to include wild stock collection, the genetic monitoring is also expanded to include monitoring of the additional wild stocks as they are released in the San Joaquin River.

- Issue Annual Technical Memorandum Consistent with 10(j) and 4(d) Rule Package – NMFS will continue to issue the annual technical memorandum.

- Prepare and Issue Report to Congress Under Section 10011(d) – Section 10011(d) of the Settlement Act calls for the Secretary of Commerce to prepare a report to Congress on the progress made on the reintroduction actions in the Settlement and Settlement Act. NMFS will prepare this report on behalf of the Secretary of Commerce during the Ten Year Vision. The cost of preparing this report is assumed to be included in NMFS' Program Staffing and Administration costs.

The estimated costs for fish establishment actions by year for the Ten Year Vision is provided in Table 5-15.

Table 5-15. Estimated Fish Establishment Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Operation of the Conservation Facility [1]	$700	$700	$700	$700	$700	$3,500
Federal cost	$700	$700	$700	$0	$0	$2,100
State cost	$0	$0	$0	$700	$700	$1,400
Spring-run Donor Stock Collection [2]	$230	$230	$230	$230	$230	$1,150
Trap and Haul	$592	$592	$592	$0	$0	$1,776
Genetics Monitoring [2]	$350	$350	$350	$350	$350	$1,750
Issue Annual Technical Memorandum pursuant to 10(j) and 4(d) Rule Package[3]	$0	$0	$0	$0	$0	$0
Total	$1,872	$1,872	$1,872	$1,280	$1,280	$8,176

Notes:
1. Reclamation has agreed to pay for the operations and maintenance of the Conservation Facility until June 2022. After that, it is assumed that the operations and maintenance is a State cost.
2. The cost of this effort is included in NMFS Program Staffing and Administrative costs.

Uncertainties and possible future changes in Fish Establishment Actions include the following:

- Segregation Actions – The Implementing Agencies will investigate the need for and feasible methods to segregate fall- and spring-run spawners to reduce interbreeding between the two runs in the Five Year Vision. The need for, and costs of, segregation actions are unknown at this time and not included in the Ten Year Vision.

5.7 Water Management Goal and Friant Division Improvements

During the Ten Year Vision, the SJRRP will focus on the following Water Management Goal and Friant Division Improvement actions:

- Water Management Goal Oversight – Continue overall support of the Water Management Goal and ensure individual actions are being completed efficiently and effectively. This includes the following: the Friant Contractors taking a co-lead on water management actions, with Reclamation providing assistance and resources; quarterly technical feedback meetings; facilitating the recapture and recirculation of Restoration Flows; facilitating the tracking of available RWA balances; and, allocating RWA balances to Friant Contractors.

- Recapture and Recirculation Plan and Implementation – Continue to implement projects identified as part of the Investment Strategy for the purpose of accomplishing the part of Paragraph 16(a) that states: *"The plan shall include provisions for funding necessary measures to implement the plan"*.

- Financial Assistance for Groundwater Banking Facilities – Award all funding under Part III or Section 10202(a) of Public Law 111-11 for local groundwater banking facilities that are intended to reduce or avoid the water supply impacts of the Settlement.

The estimated costs for Water Management Goal and Friant Division Improvement actions by year for the Ten Year Vision are provided in Table 5-16.

Table 5-16. Estimated Water Management Goal and Friant Division Improvement Costs for the Ten Year Vision
(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Water Management Goal Oversight	$1,200	$1,200	$1,200	$1,200	$1,200	$6,000
Recapture and Recirculation Plan and Implementation	$500	$500	$500	$500	$500	$2,500
Financial Assistance for Groundwater Banking Facilities	$15,000	$15,000	$7,000	$100	$100	$37,200
Total	**$16,700**	**$16,700**	**$8,700**	**$1,800**	**$1,800**	**$45,700**

Uncertainties and possible future changes include the following:

- Madera Canal Capacity Restoration Project – It is anticipated that the Friant-Kern Canal Capacity Restoration Project would be completed within the Five Year Vision. However, depending on the outcome of the Feasibility Study, some actions for the Madera Canal Capacity Restoration Project may extend into the Ten Year Vision. As the total cost of these projects is limited in Section 10203(a) of Public Law 111-11, costs in the Five Year

Vision would have to be reduced to accommodate any actions that extend into the Ten Year Vision.

5.8 Miscellaneous and/or Opportunistic Actions

Similar to the Five Year Vision, it is expected that some project costs may be higher than anticipated, some actions may come up at the last minute that were not included in this Framework, adaptive management actions may be needed that were not originally envisioned, and/or the Restoration Administrator may recommend some actions under Paragraph 12 of the Settlement. Some of these actions could be solely SJRRP actions. However, there may also be some opportunities to cost share on projects that mutually benefit the SJRRP and other entities and organizations. This category provides a small amount of funding to address these currently unknown actions. Actual activities would be determined on a year-by-year basis and would be included in the SJRRP's Annual Work Plan.

The funds allocated for Miscellaneous and/or Opportunistic Actions by year for the Ten Year Vision are provided in Table 5-17, which includes both Federal and State funds.

Table 5-17. Estimated Miscellaneous and/or Opportunistic Actions Funding for the Ten Year Vision

(All costs in thousands, 2015 dollars)

Action	FY 20	FY 21	FY 22	FY 23	FY 24	Total
Miscellaneous and/or Opportunistic Actions	$2,700	$2,900	$3,100	$3,300	$3,500	$15,500
Note: Costs include $500 per year for the State.						

6.0 Fifteen Year Vision (FY 2025 to 2029): Completion of Conveyance Projects

This chapter provides a description of the Fifteen Year Vision, which begins in Federal FY 2025 (October 1, 2025) and ends in Federal FY 2029 (September 30, 2029). The main focus of the Fifteen Year Vision is to complete the Phase 1 channel and structural improvement projects in Paragraph 11(a) of the Settlement and to achieve full Restoration Flows. Specifically, the goals of the Fifteen Year Vision are as follows:

1. Increase channel capacity in all reaches to 4,500 cfs.

2. Complete all remaining Phase 1 / Paragraph 11(a) projects including the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project and the Salt and Mud Slough Seasonal Barriers Project.

3. Complete planning, design activities, and initiate construction for the remaining Phase 2 / Paragraph 11(b) projects including filling and/or isolating the highest priority gravel pits in Reach 1 (Paragraph 11(b)(3)) and modifications to the Chowchilla Bypass Bifurcation Structure to provide fish passage and prevent entrainment (Paragraph 11(b)(2)).

4. Continue implementing the Water Management Goal actions.

Specific actions that the Implementing Agencies intend to undertake to achieve these goals are listed below and described in more detail in the following sections:

- Program Staffing
  - Continue Program Management and Administration actions for all agencies
- Flow Actions
  - Continue most actions from Five Year Vision
  - Complete seepage and levee stability actions to allow for flows of up to 4,500 cfs in the river
- Channel and Structural Improvements
  - Complete any remaining components of the Mendota Pool Bypass and Reach 2B Project
  - Complete construction of the Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project
  - Complete construction of the Salt and Mud Slough Barriers Project
  - Complete construction of the Chowchilla Bifurcation Structure, if necessary
  - Initiate isolating or filling the highest priority gravel pits
  - Operate and maintain completed channel and structural improvements projects
- Fish Establishment
  - Continue to operate and maintain the Conservation Facility, develop a phasing out strategy

  - Complete annual spring-run donor stock collection and tagging, develop a phasing out strategy
  - Continue collection of wild stock
  - Continue salmon genetics monitoring, as needed
- Continue implementing the Water Management Goal and Friant Division Improvements
  - Continue Water Management Goal support actions include recapture and recirculation of Restoration Flows, tracking RWA balances, and allocating RWA water
  - Complete construction of any remaining Groundwater Banking facilities

6.1 Schedule, Funding Needs and Funding Outlook

For the Fifteen Year Vision, a description of the activities currently anticipated is provided. However, at this time the activities in this vision and associated costs are speculative and cannot be determined with a level of certainty. Despite this uncertainty, a summary of the preliminary cost estimates and associated funding need by year for the Fifteen Year Vision is included in Table 6-2a. Tables 6-2b and 6-2c provide a summary of costs and associated funding need for Federal and State actions, respectively. As described in the Vision Approach, while activities and costs are identified by year, the Implementing Agencies recognize that activities and cost will vary from year to year and the goal is to complete all activities within the five year timeframe. This provides the year to year flexibility necessary for a program of the size, magnitude, and complexity of the SJRRP to adjust as some actions take longer or shorter than originally planned. These costs will be developed as more information on these activities is known over time and will be added into subsequent versions of the Framework.

From a Federal perspective, within the Fifteen Year Vision, the SJRRP will again be heavily reliant on Federal appropriations. Some non-appropriated funds would be available from collections of the Friant Surcharge and water and land sales, if any, as part of the Program. However, these are expected to be small as compared to the overall funding need. Overall, the SJRRP will be funding constrained and activities will be subject to the amount of appropriated funds in the Fifteen Year Vision.

Additional funding for the continued participation of the State of California to support the implementation of the Settlement will be needed. However, for the purposes of this planning document, it is assumed that State funding will be identified and continued participation is assumed for the Fifteen Year Vision. The actual ability of the State to participate in the SJRRP and its level of participation is subject to approval of future funding.

Table 6-1 provides a summary of the schedule of the actions to be undertaken as part of the Fifteen Year Vision. The schedule may change substantially as more information is known on a specific action, preferred alternatives are selected for actions, and additional design considerations are determined. Therefore, this schedule is preliminary and will be revised in subsequent versions of the Framework.

Table 6-1. Schedule of Actions for the Fifteen Year Vision

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Flow-Related Activities					
Conservation Strategy and Flow-related Mitigation Measures					
Conservation Strategy					
Invasive Species Control	P	P	P	P	P
Vegetation Monitoring and Other	P	P	P	P	P
Re-consultation on Flows			P		
Implement Conservation Strategy Actions for Flows	P	P			
Channel Capacity Advisory Group (Includes Erosion Monitoring)	P	P	P	P	P
Physical Monitoring and Management Plan Implementation					
Steelhead Monitoring					
Programmatic Cultural Resources Consultation					
Millerton Lake Boat Ramps					
Traffic Detour Planning					
Sand Slough / Eastside Bypass Sand Removal					
Flow Management and Monitoring					
Daily Flow Management and Monitoring	P	P	P	P	P
Stream Gaging	P	P	P	P	P
Unexpected Seepage Losses					
Unreleased Restoration Flows					
Restoration Flow Guidelines			P		
Data Management	P	P	P	P	P
MAP Actions to Inform Flow Decisions	P	P	P	P	P
Water Right Annual Report	P	P	P	P	P
Seepage Actions	C	C	C	O&M	O&M
Levee Stability Actions	P	D	D	C	C
Restoration Goal Activities					
Phase I Projects					
Mendota Pool Bypass	O&M	O&M	O&M	O&M	O&M
Reach 2B and Chowchilla Bypass Structure Improvements	C	C	O&M	O&M	O&M
Reach 4B/ESB/MB Channel and Structural Improvements	D	C	C	O&M	O&M
Arroyo Canal Fish Screen and Sack Dam Fish Passage	O&M	O&M	O&M	O&M	O&M
Salt and Mud Slough Seasonal Barriers	C	O&M	O&M	O&M	O&M
Passage at Key Barriers to Migration	O&M	O&M	O&M	O&M	O&M
Phase II Projects					
Reach 4B/ESB High Flow Routing			C	C	C
Chowchilla Bifurcation Structure Fish Passage	P	D	C	C	C
Gravel Pit Filing and/or Isolation	C	D	D	C	O&M
Fisheries Re-introduction Activities					
Conservation Facility Construction (DFW cost)					
Conservation Facility Water Supply Line (Reclamation cost)					
Conservation Facility Operations and Maintenance	O&M	O&M	O&M	O&M	O&M
Donor Stock Collection	P	P	P	P	P
Trap and Haul (short-term and as needed)					
Genetics Monitoring	P	P	P	P	P
Segregation Actions					
Paragraph 12 Activities					
Water Management Goal and Friant Division Improvement Activities					
Water Management Goal Oversight	P	P	P	P	P
Recapture and Recirculation Activities	P	P	P	P	P
Friant-Kern and Madera Canal Capacity Restoration	O&M	O&M	O&M	O&M	O&M
Reverse Flow Facilities					
Financial Assistance for Groundwater Banking Projects	C				

Notes: Cell left blank = No planned activity
P = Planning, Formulation, Environmental Compliance, Studies C = Construction
D = Design Efforts, including Final Design, Data Collection, Land Acquisition O&M = Operations and Maintenance

Table 6-2a. Summary of Costs and for the Fifteen Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Administration and Program Management	**$8,258**	**$8,258**	**$8,258**	**$8,258**	**$8,258**
Reclamation[1]	$1,832	$1,832	$1,832	$1,832	$1,832
USFWS[2]	$1,702	$1,702	$1,702	$1,702	$1,702
NMFS[3]	$1,000	$1,000	$1,000	$1,000	$1,000
DWR	$924	$924	$924	$924	$924
DFW	$2,800	$2,800	$2,800	$2,800	$2,800
Flow-Related Activities	**$30,702**	**$40,263**	**$39,594**	**$100,023**	**$95,806**
Conservation Strategy and Flow-related Mitigation Measures	***$2,500***	***$2,700***	***$2,940***	***$1,200***	***$1,000***
Conservation Strategy					
Invasive Species Control	$300	$300	$300	$300	$300
Vegetation Monitoring & Other	$200	$200	$200	$200	$200
Re-consultation on Flows	$0	$0	$1,500	$0	$0
Implement Conservation Strategy Actions for Flows	$1,500	$1,500	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$500	$700	$940	$700	$500
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$0	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$1,403***	***$2,153***	***$1,529***	***$1,502***	***$2,153***
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77
Stream Gaging	$189	$189	$189	$288	$189
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$0	$0	$0	$0	$0
Restoration Flow Guidelines	$0	$0	$126	$0	$0
Data Management	$50	$50	$50	$50	$50
MAP Actions to Inform Flow Decisions	$1,050	$1,800	$1,050	$1,050	$1,800
Water Right Annual Report	$37	$37	$37	$37	$37
Seepage Actions	***$15,049***	***$17,818***	***$17,531***	***$1,480***	***$1,480***
Levee Stability Actions (not a SJRRP cost)	***$11,750***	***$17,592***	***$17,594***	***$95,841***	***$91,173***
Restoration Goal Activities	**$90,372**	**$48,108**	**$52,728**	**$56,628**	**$53,028**
Phase I Projects[4]	***$80,902***	***$45,728***	***$845***	***$845***	***$845***
Mendota Pool Bypass	$200	$200	$200	$200	$200
Reach 2B Improvements	$33,394	$220	$220	$220	$220
Reach 4B/ESB/MB Channel and Structural Improvements	$45,083	$45,083	$200	$200	$200

Table 6-2a. Summary of Costs and for the Fifteen Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$25	$25	$25	$25	$25
Salt and Mud Slough Seasonal Barriers	$2,200	$200	$200	$200	$200
Passage at Key Barriers to Migration	***$250***	***$0***	***$0***	***$0***	***$0***
Phase II Projects	***$8,170***	***$1,330***	***$50,833***	***$54,733***	***$51,133***
Reach 4B/ESB High Flow Routing	$0	$0	$45,083	$45,083	$45,083
Chowchilla Bifurcation Structure Fish Passage	$2,920	$1,080	$5,500	$4,400	$5,800
Gravel Pit Filing and/or Isolation	$5,250	$250	$250	$5,250	$250
Fisheries Re-introduction Activities	***$1,050***	***$1,050***	***$1,050***	***$1,050***	***$1,050***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$700	$700	$700	$700	$700
Donor Stock Collection	$0	$0	$0	$0	$0
Trap and Haul (short-term and as needed)	$0	$0	$0	$0	$0
Genetics Monitoring	$350	$350	$350	$350	$350
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Activities	**$1,750**	**$1,700**	**$1,700**	**$1,700**	**$1,700**
Water Management Goal Oversight[5]	$1,200	$1,200	$1,200	$1,200	$1,200
Recapture and Recirculation Activities	$500	$500	$500	$500	$500
Friant-Kern and Madera Canal Capacity Restoration	$0	$0	$0	$0	$0
Reverse Flow Facilities	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$50	$0	$0	$0	$0
Miscellaneous and/or Opportunistic Actions	**$3,700**	**$3,900**	**$4,100**	**$4,300**	**$4,500**
Total Estimated SJRRP Funding Need	**$123,032**	**$84,637**	**$88,786**	**$75,068**	**$72,119**
Levee Stability	**$11,750**	**$17,592**	**$17,594**	**$95,841**	**$91,173**
Total Estimated Funding Need	**$134,782**	**$102,229**	**$106,380**	**$170,909**	**$163,292**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.

Table 6-2b. Federal Costs for the Fifteen Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Administration and Program Management	**$4,534**	**$4,534**	**$4,534**	**$4,534**	**$4,534**
Reclamation[1]	$1,832	$1,832	$1,832	$1,832	$1,832
USFWS[2]	$1,702	$1,702	$1,702	$1,702	$1,702
NMFS[3]	$1,000	$1,000	$1,000	$1,000	$1,000
DWR	$0	$0	$0	$0	$0
DFW	$0	$0	$0	$0	$0
Flow-Related Activities	**$18,182**	**$20,951**	**$20,790**	**$3,212**	**$3,113**
Conservation Strategy and Flow-related Mitigation Measures	***$2,100***	***$2,100***	***$2,100***	***$600***	***$600***
Conservation Strategy					
Invasive Species Control	$300	$300	$300	$300	$300
Vegetation Monitoring & Other	$200	$200	$200	$200	$200
Re-consultation on Flows	$0	$0	$1,500	$0	$0
Implement Conservation Strategy Actions for Flows	$1,500	$1,500	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$100	$100	$100	$100	$100
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$0	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$1,033***	***$1,033***	***$1,159***	***$1,132***	***$1,033***
Daily Flow Management and Monitoring	$77	$77	$77	$77	$77
Stream Gaging	$119	$119	$119	$218	$119
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$0	$0	$0	$0	$0
Restoration Flow Guidelines	$0	$0	$126	$0	$0
Data Management	$50	$50	$50	$50	$50
MAP Actions to Inform Flow Decisions	$750	$750	$750	$750	$750
Water Right Annual Report	$37	$37	$37	$37	$37
Seepage Actions	***$15,049***	***$17,818***	***$17,531***	***$1,480***	***$1,480***
Levee Stability Actions (not a SJRRP cost)	***$0***	***$0***	***$0***	***$0***	***$0***
Restoration Goal Activities	**$81,132**	**$45,958**	**$46,158**	**$46,158**	**$46,158**
Phase I Projects[4]	***$80,782***	***$45,608***	***$825***	***$825***	***$825***
Mendota Pool Bypass	$200	$200	$200	$200	$200
Reach 2B Improvements	$33,374	$200	$200	$200	$200
Reach 4B/ESB/MB Channel and Structural Improvements	$44,983	$44,983	$200	$200	$200

Table 6-2b. Federal Costs for the Fifteen Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$25	$25	$25	$25	$25
Salt and Mud Slough Seasonal Barriers	$2,200	$200	$200	$200	$200
Passage at Key Barriers to Migration	$0	$0	$0	$0	$0
Phase II Projects	***$0***	***$0***	***$44,983***	***$44,983***	***$44,983***
Reach 4B/ESB High Flow Routing	$0	$0	$44,983	$44,983	$44,983
Chowchilla Bifurcation Structure Fish Passage	$0	$0	$0	$0	$0
Gravel Pit Filing and/or Isolation	$0	$0	$0	$0	$0
Fisheries Re-introduction Activities	***$350***	***$350***	***$350***	***$350***	***$350***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$0	$0	$0	$0	$0
Donor Stock Collection	$0	$0	$0	$0	$0
Trap and Haul (short-term and as needed)	$0	$0	$0	$0	$0
Genetics Monitoring	$350	$350	$350	$350	$350
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$1,750**	**$1,700**	**$1,700**	**$1,700**	**$1,700**
Water Management Goal Oversight[5]	$1,200	$1,200	$1,200	$1,200	$1,200
Recapture and Recirculation Activities	$500	$500	$500	$500	$500
Friant-Kern and Madera Canal Capacity Restoration	$0	$0	$0	$0	$0
Reverse Flow Facilities	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$50	$0	$0	$0	$0
Miscellaneous and/or Opportunistic Actions	**$3,200**	**$3,400**	**$3,600**	**$3,800**	**$4,000**
Total Estimated Federal Funding Need	**$108,798**	**$76,543**	**$76,782**	**$59,404**	**$59,505**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.

Table 6-2c. State Costs for the Fifteen Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Administration and Program Management	**$3,724**	**$3,724**	**$3,724**	**$3,724**	**$3,724**
Reclamation[1]	$0	$0	$0	$0	$0
USFWS[2]	$0	$0	$0	$0	$0
NMFS[3]	$0	$0	$0	$0	$0
DWR	$924	$924	$924	$924	$924
DFW	$2,800	$2,800	$2,800	$2,800	$2,800
Flow-Related Activities	**$12,520**	**$19,312**	**$18,804**	**$96,811**	**$92,693**
Conservation Strategy and Flow-related Mitigation Measures	***$400***	***$600***	***$840***	***$600***	***$400***
Conservation Strategy	$0	$0	$0	$0	$0
Invasive Species Control	$0	$0	$0	$0	$0
Vegetation Monitoring & Other	$0	$0	$0	$0	$0
Re-consultation on Flows	$0	$0	$0	$0	$0
Implement Conservation Strategy Actions for Flows	$0	$0	$0	$0	$0
Channel Capacity Advisory Group (Includes Erosion Monitoring)	$400	$600	$840	$600	$400
Physical Monitoring and Management Plan Implementation	$0	$0	$0	$0	$0
Steelhead Monitoring	$0	$0	$0	$0	$0
Programmatic Cultural Resources Consultation	$0	$0	$0	$0	$0
Millerton Lake Boat Ramps	$0	$0	$0	$0	$0
Traffic Detour Planning	$0	$0	$0	$0	$0
Sand Slough / Eastside Bypass Sand Removal	$0	$0	$0	$0	$0
Flow Management and Monitoring	***$370***	***$1,120***	***$370***	***$370***	***$1,120***
Daily Flow Management and Monitoring	$0	$0	$0	$0	$0
Stream Gaging	$70	$70	$70	$70	$70
Unexpected Seepage Losses	$0	$0	$0	$0	$0
Unreleased Restoration Flows	$0	$0	$0	$0	$0
Restoration Flow Guidelines	$0	$0	$0	$0	$0
Data Management	$0	$0	$0	$0	$0
MAP Actions to Inform Flow Decisions	$300	$1,050	$300	$300	$1,050
Water Right Annual Report	$0	$0	$0	$0	$0
Seepage Actions	$0	$0	$0	$0	$0
Levee Stability Actions	***$11,750***	***$17,592***	***$17,594***	***$95,841***	***$91,173***
Restoration Goal Activities	**$9,240**	**$2,150**	**$6,570**	**$10,470**	**$6,870**
Phase I Projects[4]	***$120***	***$120***	***$20***	***$20***	***$20***
Mendota Pool Bypass	$0	$0	$0	$0	$0
Reach 2B Improvements	$20	$20	$20	$20	$20
Reach 4B/ESB/MB Channel and Structural Improvements	$100	$100	$0	$0	$0

Table 6-2c. State Costs for the Fifteen Year Vision (in thousands, 2015 dollars)

Activity/Project Title	FY 25	FY 26	FY 27	FY 28	FY 29
Arroyo Canal Fish Screen and Sack Dam Fish Passage	$0	$0	$0	$0	$0
Salt and Mud Slough Seasonal Barriers	$0	$0	$0	$0	$0
Passage at Key Barriers to Migration	***$250***	$0	$0	$0	$0
Phase II Projects	***$8,170***	***$1,330***	***$5,850***	***$9,750***	***$6,150***
Reach 4B/ESB High Flow Routing	$0	$0	$100	$100	$100
Chowchilla Bifurcation Structure Fish Passage	$2,920	$1,080	$5,500	$4,400	$5,800
Gravel Pit Filing and/or Isolation	$5,250	$250	$250	$5,250	$250
Fisheries Re-introduction Activities	***$700***	***$700***	***$700***	***$700***	***$700***
Conservation Facility Construction (DFW cost)	$0	$0	$0	$0	$0
Conservation Facility Water Supply Line (Reclamation cost)	$0	$0	$0	$0	$0
Conservation Facility Operations and Maintenance	$700	$700	$700	$700	$700
Donor Stock Collection	$0	$0	$0	$0	$0
Trap and Haul (short-term and as needed)	$0	$0	$0	$0	$0
Genetics Monitoring	$0	$0	$0	$0	$0
Segregation Actions	$0	$0	$0	$0	$0
Paragraph 12 Activities	***$0***	***$0***	***$0***	***$0***	***$0***
Water Management Goal and Friant Division Improvement Activities	**$0**	**$0**	**$0**	**$0**	**$0**
Water Management Goal Oversight[5]	$0	$0	$0	$0	$0
Recapture and Recirculation Activities	$0	$0	$0	$0	$0
Friant-Kern and Madera Canal Capacity Restoration	$0	$0	$0	$0	$0
Reverse Flow Facilities	$0	$0	$0	$0	$0
Financial Assistance for Groundwater Banking Projects	$0	$0	$0	$0	$0
Miscellaneous and/or Opportunistic Actions	**$500**	**$500**	**$500**	**$500**	**$500**
Total Estimated State Funding Need	**$25,984**	**$25,686**	**$29,598**	**$111,505**	**$103,787**

Notes and Assumptions:

1. Includes Program-wide activities including public outreach (annual report, Quarterly Updates, and similar) and data management.
2. USFWS cost for FY 2015 and FY 2016 based on Interagency Agreement between USFWS and Reclamation.
3. NMFS cost for FY 2015 to FY 2017 based on Interagency Agreement between NMFS and Reclamation.
4. Costs for the Phase I Projects are estimates. Actual costs for individual projects will vary significantly as implementation progresses and projects are better defined.
5. Includes annual recapture and recirculation actions and managing Recovered Water Accounts.

6.2 Responsible Implementing Agency

Table 6-3 provides a summary of the Implementing Agencies responsible for carrying out the activities in the Fifteen Year Vision.

Table 6-3. Implementing Agency Lead in the Fifteen Year Vision

Action	Implementing Agency Lead
Program Staffing	
Federal Agencies	Reclamation will continue to provide funding for Reclamation, USFWS, and NMFS program staffing functions. However, it is expected the USFWS and NMFS consider ways to fund these activities with their own funds.
State Agencies	The State agencies will continue to provide funding for their program staffing functions.
Flow Actions	
Conservation Strategy and Flow-related Mitigation Measures	
Conservation Strategy - Invasive Species Control	Reclamation
Conservation Strategy – Re-consultation on Flows	Reclamation, with technical assistance from NMFS and USFWS
Conservation Strategy – Implement Flow Actions	Reclamation
Channel Capacity Advisory Group (includes Erosion Monitoring)	Reclamation, with technical assistance from DWR (at DWR's own cost)
Physical Monitoring and Management Plan	Reclamation, with technical assistance from DWR (at DWR's own cost)
Flow Management and Monitoring	
Daily Flow Management and Monitoring	Reclamation
Stream Gaging	Reclamation and DWR
Unexpected Seepage Losses	Reclamation
Unreleased Restoration Flows	Reclamation
Restoration Flow Guidelines	Reclamation
Data Management	Reclamation
MAP Actions to Inform Flow Decisions	Reclamation, DWR, and DFW
Water Right Compliance and Annual Report	Reclamation
Seepage, Levee Stability, and Flowage Easement	
Seepage	Reclamation
Levee Stability	DWR
Channel and Structural Improvements	
Reach 4B Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project Land Acquisition and Final Design	Reclamation and DWR. At this time, Reclamation and DWR have not determined how to share in construction costs and long-term operations and maintenance costs for this project. It is anticipated that this discussion will happen as the project is further developed and would be included in subsequent revisions to the Framework.
Salt and Mud Slough Barriers Project	Reclamation

Table 6-3. Implementing Agency Lead in the Fifteen Year Vision

Action	Implementing Agency Lead
Planning, Design and Construction for Any Remaining Phase 2 / Paragraph 11(b) Projects	Reclamation and DWR. At this time, Reclamation and DWR have not determined if and how to share costs for these projects. It is anticipated that this discussion will happen as the projects are further developed and would be included in subsequent revisions to the Framework.
Operate and Maintain Completed Channel and Structural Improvements Projects	Reclamation and DWR. At this time, Reclamation and DWR have not determined if and how to share costs for these projects. It is anticipated that this discussion will happen as the projects are further developed and would be included in subsequent revisions to the Framework.
Fish Establishment	
Operation of the Conservation Facility	DFW
Spring-run Donor Stock Collection	USFWS and DFW
Genetics Monitoring	Reclamation and DFW
Issue Annual Technical Memorandum pursuant to 10(j) and 4(d) Rule Package	NMFS
Water Management Goal and Friant Division Improvement Actions	
Recapture, Recirculation and Tracking / Allocating RWA water	Reclamation
Recapture and Recirculation Plan	Reclamation
Manage Part III Funds and Projects	Reclamation

6.3 Program Staffing and Administration

Program staffing and administration includes a wide array of activities including funding for Reclamation, USFWS, NMFS, DWR, and DFW program wide-related activities and administration and program-wide public and landowner outreach. During the Fifteen Year Vision, costs are generally expected to be stagnant and not increase to reflect the beginning of ramp down of Program efforts, resulting in reduced costs and staffing needs.

6.4 Flow Actions

The Fifteen Year Vision generally includes the same actions as the Ten Year Vision. However, the Fifteen Year Vision includes addressing the seepage and levee stability commitments made in the PEIS/R ROD to allow for flows of up to 4,500 cfs in the river. The flow-related actions that are expected to occur in the Fifteen Year Vision are described below.

6.4.1 Conservation Strategy and Flow-related Mitigation Measures

Conservation strategy and flow-related mitigation measures and environmental commitments include the actions and commitments identified in the PEIS/R ROD related to flows. Specifically, within the Fifteen Year Vision, this includes the following:

- Conservation Strategy – See section 4.4.1 for a description of the Conservation Strategy. Specifically, within the Fifteen Year Vision the following project-level action are anticipated:

    - Invasive Species Control – Conservation Measure INV-1 includes the implementation of the Invasive Vegetation Monitoring and Management Plan for the SJRRP (Appendix L of the Draft PEIS/R), which includes measures to monitor, control, and where possible eradicate, invasive plant infestations during flow releases.

    - Vegetation Monitoring and Other – Conservation Measure RHSNC-1 requires development and implementation of the Riparian Habitat Mitigation and Monitoring Plan. The draft Riparian Habitat Mitigation and Monitoring Plan requires updating of the riparian habitat map every 2-5 years. In addition, the Physical Monitoring and Management Plan requires routine transect monitoring following peak flow events.

    - Re-consultation on Flows – Consistent with the Biological Opinions issued by NMFS and USFWS, Reclamation will need to reconsult periodically to increase Restoration Flow releases. In preparation for increased Restoration Flow releases to 4,500 cfs near the end of the Fifteen Year Vision, one re-consultation effort on flows is anticipated.

    - Implement Conservation Strategy Actions for Flows Above 1,660 cfs Release – In general, the PEIS/R ROD recognized that limited data was available to determine the impacts of flows above a 1,660 cfs release from Friant Dam and therefore, there was limited ability to determine the potential impacts to species and habitat from these higher releases. To address this, the Conservation Strategy included a series of monitoring, data collection, and analysis efforts. This action includes implementing these efforts along with an assumed amount of avoidance, minimization and mitigation measures to address the potential impacts of higher flow releases on species and habitats.

- Channel Capacity Advisory Group – This action is described in Section 4.4.1 and would be a continuation of the same actions in the Five Year Vision. Actual actions to improve channel capacity are identified under the Section 6.4.3, Seepage and Levee Stability, and Section 6.5, Channel and Structural Improvements.

- Physical Monitoring and Management Plan – This action is described in Section 4.4.1. The flow monitoring component is addressed in Section 6.4.2, Flow Management and Monitoring. The groundwater seepage component is address in Section 6.4.3, Seepage and Levee Stability. The channel capacity component is addressed in the bullet above and in Section 6.4.3, Seepage and Levee Stability. For the same reasons as described in the Five Year Vision, no actions would be implemented in the Fifteen Year Vision.

Uncertainties and possible future changes the conservation strategy and flow-related mitigation measures and environmental commitments for the Fifteen Year Vision include the following:

- Conservation Strategy – Re-consultation on Flows – The level of effort for this is generally unknown at this time.

- Conservation Strategy – Implement Conservation Strategy Actions for Flows Above 1,660 cfs Release – The actual data needs, level of analysis and avoidance, minimization and mitigation measures to address the potential impacts of higher flow releases on species and habitats are unknown at this time.

- Channel Capacity Advisory Group (includes Erosion Monitoring) – The amount of erosion management actions is unknown at this time.

- Cultural Resources – As described in Section 4.4.1., the need for long-term preservation is not included, but may be necessary if any preservation of resources is determined necessary.

6.4.2 Flow Management and Monitoring

Flow management and monitoring actions in the Fifteen Year Vision are generally the same as and a continuation of those in the Five and Ten Year Visions. See Section 4.4.2 and 5.4.2 for a description of these actions. However, as channel capacities are expanded over time, the need to manage Unreleased Restoration Flows decreases. It is assumed that all Restoration Flows can be released into the river and no Unreleased Restoration Flows exist in the Fifteen Year Vision. Similar to the Five Year Vision, no acquisition of Unexpected Seepage Loss water is anticipated. The Fifteen Year Vision also assumes that some revisions to the Restoration Flow Guidelines will continue to be necessary.

Uncertainties and possible future changes in Flow Management and Monitoring Actions include the following:

- Unexpected Seepage Losses – While Reclamation can develop cost-neutral banking, storing, exchange, transfer, and sale on water and options for specific quantities, the ability to reach the quantities called for in the Settlement is unknown.

- Restoration Flow Guidelines – The number of revisions in the future is unknown and many may not be necessary by the Fifteen Year Vision.

- Data Management – Changes in Reclamation policies, stakeholder requirements, and new and / or improved software development could increase or decrease the scope and level of effort of this activity.

- MAP Actions to Inform Flow Decisions – The MAP studies and monitoring actions will vary year-to-year depending upon the information needs, opportunities provided by hydrology and fisheries information needs. MAP information needs in this Fifteen Year Vision include studies to prioritize gravel pit isolation.

6.4.3 Seepage and Levee Stability

Seepage and levee stability includes the actions necessary to meet the commitments in the PEIS/R ROD to release flows in a way that does not result in material adverse impacts to

adjacent agricultural lands from seepage or result in material adverse impacts to levee stability. Below are the groundwater seepage and levee stability actions anticipated in the Fifteen Year Vision.

- Groundwater Seepage – Groundwater seepage concerns are described in Section 4.4.3. Properties in all reaches may experience groundwater seepage concerns at flows between 2,500 cfs and 4,500 cfs. Interceptor lines, seepage easements, fee-simple acquisition, or other physical projects such as slurry walls or drainage ditches would be constructed to allow higher Restoration Flows without groundwater seepage impacts. Reclamation anticipates completing seepage projects to allow flows up to 4,500 cfs by 2030, at an estimated cost of $53.358 million.

- Levee Stability – Levee stability concerns are described in Section 4.4.3. This document assumes that any flow higher than one foot onto the levee will require remediation (except for the Middle Eastside Bypass, which has a limitation of two feet). Slurry walls or toe drains would be constructed to address levee stability. DWR anticipates the levee remediation work to allow flows up to 4,500 cfs could be completed by the end of 2030 if funding is available.

The levee remediation projects address levee stability issues where between 2,500 cfs and 4,500 cfs exceeds 1 feet above the levee toe (except for the Middle Eastside Bypass, which has a limitation of 2 feet), based on preliminary geotechnical investigations and hydraulic modeling by DWR. Estimated costs to address these areas for the Fifteen Year Vision are provided in Table 6-4. This unit cost is based on the average linear foot cost of interceptor lines from preliminary designs by Reclamation's groundwater seepage contractor, including construction and operations and maintenance costs. The unit costs for the slurry walls are based on recommendations from DWR's Division of Flood Management and are $1,800 per linear foot. Slurry wall costs are used in the totals as a conservative (i.e., high) cost, although drains may be constructed in some locations instead.

Table 6-4. Levee Remediation to Address Levee Stability Issues where between 2,500 cfs and 4,500 cfs Exceeds 1 feet above Levee Toe or 2 feet above the Toe in the Middle Eastside Bypass

Reach	Impacted Left Levee Length (feet)	Impacted Right Levee Length (feet)	Total Impacted Levee Length (feet)	Total Cost of Remediation with Toe Drains	Total Cost of Remediation with Slurry Walls
2A	3,940	4,300	8,240	$4,021,120	$14,832,000
3	31,630	28,470	60,100	$29,328,800	$108,180,000
4A	17,260	9,890	27,150	$13,249,200	$48, 870,000
5 (all)	6,360	1,110	7,470	$3,645,360	$13,446,000
Middle Eastside Bypass	16, 050	10,090	26,140	$12,756,320	$47,052,000
Lower Eastside Bypass	500	160	660	$322,080	$1,188,000
Total	**75,740**	**54,020**	**129,760**	**$63,322,880**	**$233,568,000**

Uncertainties and possible future changes in seepage and levee stability actions include the following:

- Seepage and levee stability actions and associated costs should decrease due to additional analyses and seepage projects also solving levee stability issues (or vice versa).

- Levee stability costs are expected to decrease when geotechnical investigations are completed. Subsidence may increase levee stability costs. Levee costs are highly uncertain.

- Reach 5 may require some groundwater seepage projects. The extent of these is currently unknown.

6.5 Channel and Structural Improvements

The following are the channel and structural improvements actions anticipated in the Fifteen Year Vision:

- Complete any remaining components of the Mendota Pool Bypass and Reach 2B Project

- Complete construction of the Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project

- Complete construction of the Salt and Mud Slough Barriers Project

- Complete planning and design and initiate construction for any remaining Phase 2 / Paragraph 11(b) projects

- Complete modifications to the Chowchilla Bifurcation Structure to provide fish passage and prevent entrainment

- Operate and maintain completed channel and structural improvements projects

These actions are described in more detail below.

6.5.1 Remaining Components of the Mendota Pool Bypass and Reach 2B Project

During the Fifteen Year Vision, floodplain grading and revegetation would continue within the Reach 2B levees and floodplain. The following actions are included in the Fifteen Year Vision:

- Revegetation, estimated at $33.374 million – The revegetation cost includes a combination of active and passive planting.

- Operations and maintenance, estimated at $220,000 per year.

Uncertainties and possible future changes include the following:

- San Mateo Avenue culverts ($9.6 million not indexed to 2015 dollars) are not included in the Fifteen Year Vision, as only half of the road is public, and the SJRRP will try to close the Madera County side for cost savings and due to local landowner preference. If this component is necessary, costs will increase.

- The Mendota Pool Bifurcation Structure Fish Screen ($27 million not indexed to 2015 dollars) is not included in the Fifteen Year Vision, as fish could only go into Mendota Pool when deliveries are being made to the Exchange Contractors for water supply (which is very rare, and occurred for the first time ever in 2014), or when deliveries are made for flood flows (which only occurs when the Kings River is not in flood). If this component is necessary, costs will increase.

- Lone Willow Slough Fish Screen ($850,000 not indexed to 2015 dollars) is not included in the Fifteen Year Vision, as this diversion is only for flood flow diversions and is only 125 cfs, so is both infrequent and unlikely to entrain many fish. If this component is necessary, costs will increase.

- The Reach 3 Fish Barrier ($60.4 million not indexed to 2015 dollars) is not included in the Fifteen Year Vision, as fish cannot enter Mendota Pool as it is blocked by Mendota Dam, attraction flows during fish migration seasons will be coming from the Compact Bypass, and fish that stray have a short path to backtrack. If this component is necessary, costs will increase.

6.5.2 Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project

During the Fifteen Year Vision, it is assumed that the Reach 4B, Eastside Bypass, Mariposa Bypass Channel and Structural Improvements Project are constructed. The selected alternative is uncertain and the schedule and costs are also uncertain.

Floodplain grading and revegetation could be a substantial cost. During this Fifteen Year Vision, some land would be regraded for floodplain habitat and seed banks would be added to add native vegetation. However, some land may be acquired by the government and then leased or rented back to growers to continue to farm or graze within the floodplain. This allows floodplain grading and revegetation to occur over a longer period, minimizes the growth of invasive plants due to farming operations, retains a land management entity, and reduces the amount of agricultural land taken out of production at one time. Over the long term, more of this land may be converted to floodplain habitat, or agreements may be reached with growers to create multiple use properties managed for habitat uses while allowing farming to continue.

Total project costs range from $157,560,000 to $339,935,000 depending on the alternative. However, depending on the alternative selected, some components of the Reach 4B project may have been constructed in the Five Year Vision, under fish passage activities. Costs include a 5-percent mobilization contingency, 15-percent design contingency, and a 25-percent construction contingency. Non-project costs (environmental compliance, permitting, mitigation, etc) are not included in the Reach 4B project costs at this time. Land acquisition costs are based on the

average cropland price in Merced County from the 2013 Ag Land Trends Report of the California Chapter of the American Society for Farm Managers and Rural Appraisers. El Nido Road, Merced National Wildlife Refuge pumping plant, and the Dan McNamara Road crossing costs are excluded, as these project components are completed in the Five Year Vision.

The average cost of all of the Reach 4B project alternatives is $198 million. This excludes land acquisition as land acquisition is covered in the Ten Year Vision. Costs are show in Tables 6-2a through 6-2c in both the "Reach 4B/ESB/MB Channel and Structural Improvements" and the "Reach 4B/ESB High Flow Routing" line items.

Uncertainties and possible future changes include the following:

- For the purposes of the cost estimate in this Revised Framework, it is assumed that Reach 4B project costs are the average of all alternatives. When an alternative is selected, the costs will change.
- Land acquisition costs could drastically change.
- Permitting and mitigation costs are not included as they are too speculative at this time.
- Final fish passage design criteria will have a large effect on structure costs. Factors which can greatly increase costs include whether fish require raised roadways, passage protection during flood flows, elimination of upstream backwater conditions, sturgeon passage, upstream juvenile salmon passage, or passage for other native fishes.
- Future Value Engineering studies could result in cost reduction ideas.
- Schedules and costs represent costs for Federal projects. Local knowledge and partnership could reduce costs or schedules.

6.5.3 Salt and Mud Slough Seasonal Barriers Project

During the Fifteen Year Vision, it is assumed that the Salt and Mud Slough Seasonal Barriers Project would be constructed. Little information is known on where the barriers would be located and design considerations. At present, it is assumed that a seasonal barrier-type structure would be constructed. A more permanent structure would increase construction costs, but may reduce operations and maintenance costs. The scope of this project may change substantially based on the study efforts described in the Ten Year Vision.

6.5.4 Remaining Phase 2 / Paragraph 11(b) Projects

During the Fifteen Year Vision, the Implementing Agencies would work to complete planning and design activities and make final decisions to pursue any remaining Phase 2 or Paragraph 11(b) projects. The following two Paragraph 11(b) projects would occur within the Fifteen Year Vision:

- Modifications to the Chowchilla Bifurcation Structure to provide fish passage and prevent entrainment if the Secretary of the Interior, in consultation with the Restoration Administrator and with the concurrence of the NMFS and USFWS determines that such

modifications are necessary to achieve the Restoration Goal of the Settlement. State costs of $19.7 million are included in this Fifteen Year Vision.

- Filling and/or isolating the highest priority gravel pits in Reach 1 (such "highest priority gravel pits" shall be determined by the Secretary of the Interior, in consultation with the Restoration Administrator, based on the relative potential for reducing juvenile mortality). State costs of $10 million are included to construct a few of the highest priority gravel isolation projects in this Fifteen Year Vision.

6.5.5 Operate and Maintain Completed Channel and Structural Improvements Projects

During the Five and Ten Year Visions, some channel and structural improvements projects would be completed, including the Mendota Pool Bypass and Reach 2B Channel Improvements Project, the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project and seepage and levee stability actions. These improvements would be operated and maintained during the Fifteen Year Vision.

6.6 Fish Establishment

Over the Fifteen Year Vision, the SJRRP will focus on the following Fish Reintroduction actions:

- Operation of the Conservation Facility – DFW will continue to operate the Conservation Facility. Funding is anticipated to be provided by the State during this time period. In addition, during the Fifteen Year Vision, the Implementing Agencies will develop a phasing out strategy for the Conservation Facility. This strategy may be implemented in the Fifteen Year Vision or later.

- Genetics Monitoring – The SJRRP will continue genetic analysis for spring-run and fall-run.

- Issue Annual Technical Memorandum Consistent with 10(j) and 4(d) Rule Package – Consistent with Section 10011(c)(2) of the Settlement Act, the Secretary of Commerce issued a final rule pursuant to section 4(d) of the Endangered Species Act governing the incidental take of reintroduced spring-run salmon. The rule requires the preparation of an annual technical memorandum. During the Fifteen Year Vision, NMFS will continue to issue the technical memorandum.

Uncertainties and possible future changes in Fish Establishment Actions include the following:

- Segregation Actions – The Implementing Agencies will investigate the need for and feasible methods to segregate fall- and spring-run spawners to reduce interbreeding between the two runs in the Five Year Vision. The need for segregation actions is unknown at this time and it is not included in the Fifteen Year Vision.

6.7 Water Management Goal and Friant Division Improvements

During the Fifteen Year Vision, the SJRRP will focus on the following Water Management Goal and Friant Division Improvement actions:

- Water Management Goal Oversight – Continue overall support of the Water Management Goal and ensure individual actions are being completed efficiently and effectively. This includes the same actions as were identified in the Ten Year Vision (see Section 5.7).

- Recapture and Recirculation Plan and Implementation – Continue to implement projects identified as part of the Investment Strategy as described in the Ten Year Vision (see Section 5.7).

- Financial Assistance for Groundwater Banking Projects – Complete construction of the projects awarded funds in the Ten Year Vision and close these projects out.

Uncertainties and possible future changes include the following:

- Financial Assistance for Groundwater Banking Projects – Section 10203(c) of Public Law 111-11 authorizes up to $50 million in new Federal appropriations, in October 2008 price levels, for financial assistance for groundwater banking projects. The $50 million in March 2015 price levels is $55,024,720 indexed based on the United States inflation rate.

6.8 Miscellaneous and/or Opportunistic Actions

Similar to the Five and Ten Year Visions, it is expected that some project costs may be higher than anticipated, some actions may come up at the last minute that were not included in this Framework, adaptive management actions may be needed that were not originally envisioned, and/or the Restoration Administrator may recommend some actions under Paragraph 12. Some of these actions could be solely SJRRP actions. However, there may also be some opportunities to cost share on projects that mutually benefit the SJRRP and other entities and organizations. This category provides a small amount of funding to address these currently unknown actions. Actual activities would be determined on a year-by-year basis and would be included in the SJRRP's Annual Work Plan.

This page left intentionally blank

7.0 Beyond Fifteen Years (FY 2030+): Monitoring, Maintenance and Final Project Work

This chapter provides a description of the Beyond Fifteen Year Vision, which begins in Federal FY 2030 (October 1, 2029). The main focus of the Beyond Fifteen Year Vision is to complete all remaining construction actions, monitor and maintain the system, achieve a naturally reproducing, self-sustaining population of spring-run and fall-run Chinook salmon, and maximize SJRRP success. Specifically, the goals of the Beyond Fifteen Year Vision are as follows:

- Complete all remaining Phase 2 / Paragraph 11(b) projects.
- Complete all Paragraph 12 projects, if any are recommended.
- Monitor and maintain the SJRRP projects and fish actions.
- Achieve a naturally reproducing, self-sustaining population of spring-run and fall-run Chinook salmon by phasing out the Conservation Facility and donor stock collection efforts.
- Maximize success of the SJRRP

Specific actions that the Implementing Agencies intend to undertake to achieve these goals are listed below:

- Program Staffing
  - Reduced Program Management and Administration actions for all agencies
- Flow Actions
  - Continue to release and monitor Restoration Flows
- Channel and Structural Improvements
  - Complete planning and construction of all Phase 2 / Paragraph 11(b) projects
  - Complete planning and construction of all Paragraph 12 Projects
- Fish Establishment
  - Phase out Conservation Facility and donor stock collection
  - Monitor self-sustaining, naturally reproducing salmon populations
- Continue implementing the Water Management Goal
  - Continue Water Management Goal support actions include recapture and recirculation of Restoration Flows, tracking RWA balances, and allocating RWA water

At this time, it is difficult to predict the actual actions that would take place in the Beyond Fifteen Year Vision as many of these actions will depend on decisions not yet made and/or will depend on progress and actions within the previous years. Therefore, no detail, schedule or costs are provided for these actions at this time as there is simply no way to determine this without a tremendous amount of uncertainty. However, in general, the Beyond Fifteen Year Vision focuses on a significant ramp down and completion of Program activities with a transition to ongoing monitoring, operations, and maintenance actions.

8.0 Establishment of Salmon Populations

8.1 Introduction

This chapter provides more information on the vision for establishing naturally reproducing, self-sustaining populations of spring-run and fall-run Chinook salmon within the context of the Five, Ten, Fifteen, and Beyond Fifteen Year Visions described in this Revised Framework. The purposes of this chapter are to; (1) describe the relationship between the schedule in the Framework and the establishment of salmon populations; and, (2) communicate the linkages between Chinook salmon actions and the various physical projects that increase channel capacity and habitat within the river corridor. Using the visions described in this Revised Framework, this chapter describes the relationship between the revised schedule and the establishment of salmon populations.

The Program is currently pursuing a number of ongoing activities that will further the establishment of self-sustaining and naturally reproducing salmon populations and improve upon the information included in this chapter. These activities include, but are not limited to, revising population targets and refining estimates of existing habitat. The Revised Framework outlines a more specific sequence and longer timeline for projects than described in the Settlement, and the process of establishing salmon populations will continue through the period of project completion. The Program is currently pursuing an inclusive process that will result in developing an updated Fisheries Framework for Implementation that considers the revised schedule in this Framework. The updated Fisheries Framework for Implementation is expected to be completed in May 2016. This Fisheries Framework will detail the following:

- Anticipated timelines for completion of renewed permits for spring-run salmon stock collection as well as a new permits for collection of wild stocks (if not included in the renewed permit);

- Roles and responsibilities of the Implementing Agencies with regard to fish actions;

- Objectives and key milestones for the establishment of spring-run and fall-run salmon in the Restoration Area through time;

- Objectives related to habitat and ecosystem conditions necessary to support salmon milestones and general plans for providing the habitat necessary to support the SJRRP's long-term population goals;

- Questions and data gaps that require additional research along with the schedule to resolve these data gaps and a general discussion of on-going and long-term monitoring needs;

- The need for a temporary or permanent project to assist juvenile outmigration; and,

- The desired timeline for removal of the Hills Ferry Barrier.

This chapter expresses the current state of understanding of the Implementing Agencies, and is not a final assessment of the opportunities and constraints for establishing salmon populations nor a commitment to specific actions. This chapter, along with much of the Revised Framework, is intended to be a living document updated through time as progress is achieved and our understanding improves.

8.2 Background and Accomplishments to Date

The process of establishing fall-run and spring-run Chinook salmon in the upper San Joaquin River (upstream of the Merced River confluence) begins with the release of salmon in the Restoration Area with the expectation that some percentage of those fish will successfully complete their lifecycle and contribute to future generations and the SJRRP's long-term population goals. This process and the expectations of individual actions should be consistent with the current schedule and expected status of the river described in the Revised Framework. The SJRRP has begun the process of establishing salmon populations through several activities, including:

- Trap-and-transport of adult fall-run Chinook salmon in 2013 and 2014;
- Two years of field testing low flow trap-and-transport of juvenile fall-run Chinook salmon;
- Two years of releases of approximately 54,000 spring-run Chinook salmon juveniles;
- Completion of special rules and permits for the release of spring-run Chinook salmon as an ESA experimental population; and
- Initiation of a spring-run Chinook salmon broodstock program, including "proof of concept" testing with fall-run Chinook salmon, and Feather River Fish Hatchery spring-run Chinook salmon using an interim facility, along with completion of planning and permitting to construct a full-scale Salmon Conservation and Research Facility.

A detailed list of accomplishments to establish salmon populations is provided in Appendix A.

8.3 Future Actions

The Restoration Goal of the Settlement includes the successful establishment of naturally reproducing and self-sustaining populations of fall-run and spring-run Chinook salmon and other fish to the San Joaquin River from Friant Dam to the Merced River. Achieving the Chinook salmon element of the Restoration Goal hinges on the progressive introduction and growth of fish populations (via natural reproduction and conservation hatchery supplementation) and the enhancement of the physical river system and habitat necessary to support those fish. Salmon actions will be consistent with the progress towards obtaining in-river flows, adult and juvenile passage, and suitable habitat conditions.

This Revised Framework is primarily focused on activities necessary to plan, permit, design, and construct the major physical project elements of the SJRRP. Through identification of these

project completion schedules, this Revised Framework outlines the timelines for increasing flow capacity within the Restoration Area and completion of projects that will allow passage of salmon, improve habitat conditions, and provide protection from entrainment. These project actions occur in parallel with activities that will increase juvenile releases, thereby increasing the potential for adult returns and subsequent spawning activity. It is important to understand the interdependence of the progress of salmon activities and establishment of the salmon population with completion of the physical projects. The construction of or access to physical habitat areas will drive the success of salmon establishment and drive, to some extent, population numbers, and the requirements to support the salmon population targets will inform the design and sequence of physical projects. Monitoring actions will be fundamental to understanding the overall progress of establishing salmon populations and will inform the design and sequence of physical projects and flow releases.

As noted earlier, the ability of the river to support spring and fall-run Chinook salmon in both the short and long term necessitates the completion of flow, channel capacity, and habitat improvement projects. As a result, flow, channel capacity, and habitat related projects are key drivers of the SJRRP schedule and budget for the near-term. With this in mind, salmon actions and key milestones must be aligned with the schedule of flow and channel capacity projects to the extent that those projects alleviate limitations to the system's capacity to support the establishment of salmon populations.

8.3.1 Flow Connectivity and Fish Passage

Providing flow connectivity and passage is essential for establishing naturally-reproducing and self-sustaining salmon populations in the Restoration Area. Adequate flows and passage will allow salmon to complete their life history without intervention and the SJRRP to make progress toward meeting the Restoration Goal. Table 8-1 provides a summary of the key flow connectivity challenges and when they are expected to be resolved to allow fish passage without human assistance.

Table 8-1. Key Fish Passage Challenges for Different Life Stages and When Expected to be Resolved

Life Stage	Passage Challenge	When Expected to be Resolved
Juvenile Outmigration	Flow connectivity of at least 300 cfs in all reaches (does not include temperature management needs)	Spring 2016
Fall-run Adult Migration	700 cfs allows full Restoration Flows for adult migration including attraction flows.	End of 2018
Spring-run Adult Migration	1,300 cfs in all reaches and passage over key barriers to migration and use of flows to mediate temperatures	End of 2019
Notes: Better survival and success would likely be achieved as flows increase and additional barriers are addressed.		

The ability for juveniles to migrate successfully out of the Restoration Area without assistance is currently a major constraint to salmon completing their life cycle. Based on information

developed by the SJRRP, a minimum of approximately 300 cfs capacity in all reaches of the river will provide connectivity at adequate depths for juvenile outmigration (SJRRP 2011). This capacity is expected to be achieved by spring 2016 through completion of seepage projects described in the Revised Framework. At this flow level, juveniles could potentially migrate through the system, but survival rates are expected to be lower than survival under full Restoration Flows and completion of the physical projects due to the potentially high temperatures, low water depths, increased predation, and entrainment at diversions. Juvenile migratory success will increase as flows increase, the Mendota Pool Bypass is completed (reduces entrainment in the diversions off of Mendota Pool), and Arroyo Canal is screened. Further, observations in 2011 showed that juvenile salmon were able to migrate successfully during flood conditions prior to the completion of any of the Phase 1 / Paragraph 11(a) projects.

The SJRRP is also evaluating the potential to provide emigration assistance through the capture and transport of juvenile salmon. In 2014, the SJRRP evaluated a number of design options for implementing a juvenile trap and haul program in the Restoration Area (SJRRP 2014). This report identified methodologies ranging from portable traps to permanent infrastructure for capturing migrating juvenile salmon and potential locations for deployment. The SJRRP also completed two years of field evaluations of low flow trapping and transporting in 2014 and 2015. In 2015, the SJRRP will produce an addendum to the 2014 report that looks more closely at design elements for specific locations and methods for deployment of a trapping structure. These analyses will be evaluated later in 2015 to advise juvenile trapping efforts in 2016 and beyond.

To provide upstream volitional passage for adult fall-run Chinook salmon, key barriers to migration identified in Section 4.5.3 and 4.5.4 will need to be addressed These barriers are expected to be addressed by the end of FY 2019, and channel capacity is projected to be sufficient to support the fall hydrograph identified by the Settlement including pulse flows to attract adults. Therefore, trap and haul of fall-run adults may end after FY 2019. The SJRRP anticipates studying adult migration to evaluate passage success prior to ending trap and haul operations.

Due to their timing of migration, spring-run Chinook salmon may face higher temperatures than fall-run Chinook salmon during a portion of their migration window. The actual run timing of future spring-run salmon adult returns to the Restoration Area is uncertain. Spring-run migration rates from freshwater entry to spawning areas varies considerably across their range, so we cannot assume the timing of migration through the Restoration area will completely match what is seen it other systems. Applying run timing information from other systems to temperature projections in the Restoration Area suggests that spring-run salmon could be exposed to a broad range of temperatures. Early in the migration window temperatures will be cooler and suitable, but temperatures may exceed passage thresholds later in the season. Based on previous unpublished information developed by the SJRRP, approximately 1,300 cfs capacity in all reaches of the river is expected to help ameliorate temperature conditions for adult spring-run salmon immigration and extend the migration window. Having spring-run salmon return to the system will provide insight to the timing of migration and how fish respond to rising temperatures which will provide the SJRRP with a better understanding of whether spring temperatures will impact migrating adults. Key migration barriers identified in Section 4.5.3 and 4.5.4 also need to be addressed to provide volitional passage. Flow capacity of 1,300 cfs and the physical barriers are expected to be addressed by the end of FY 2019. Therefore, trap and haul of spring-run adults may end after

FY 2019. Similar to fall-run salmon, the SJRRP anticipates studying adult spring-run salmon migration to evaluate passage success prior to ending trap and haul operations.

8.3.2 Available Spawning and Incubation Habitat

Sufficient availability and quality of spawning habitat in Reach 1 is essential to achieve naturally reproducing, self-sustaining population of Chinook salmon on the San Joaquin River. Estimates of existing and required Chinook salmon spawning habitat in Reach 1 vary considerably. Spring-run Chinook salmon spawning habitat objectives for the SJRRP were estimated as a minimum of 78,000 square meters (m^2) of quality functioning spawning habitat in the first 5 miles below Friant Dam in order to meet the long term population targets of 30,000 spring-run and 10,000 fall-run (Deister 2007, Meade 2008, SJRRP 2010). If the available spawning habitat is insufficient for the number of returning adults, the population will not continue to grow. Therefore, it is important to ensure there is enough spawning habitat to meet the long term targets and that habitat quantity keeps pace with the expected number of returning adults. Spawning habitat quality is also important, even under relatively small population sizes, because lower quality habitat will lead to lower egg incubation survival rates that will ultimately influence the rate of population growth.

Currently, using best available data, it appears that the quantity of spawning habitat may be sufficient for the next five years and salmon population growth should not be limited by concerns over the amount of quality spawning habitat. The Spawning and Incubation Small Interdisciplinary Group is working to develop a habitat assessment model to estimate the suitable habitat within the Restoration Area and the potential need for any spawning habitat augmentation or improvement, as well as the appropriate timing of those improvements. As data supporting these models is refined, more accurate estimates of potential spawning habitat suitability will be available to better manage and anticipate needs. A habitat assessment report is scheduled to be completed in May 2016.

8.3.3 Available Rearing Habitat

Juvenile rearing habitat is not likely to be limiting during the Five Year Vision, given the low number of juveniles likely to be present in the system from juvenile releases or the offspring of returning adults. However, depending on the pace of increase of adult returns, juvenile rearing habitat may become a limiting factor during the Ten or Fifteen year visions unless habitat enhancements keep pace with population growth. The schedule of rearing habitat development in this Revised Implementation Framework is expected to keep pace with growing population's needs for rearing habitat.

Tables 8-2 and 8-3 below show the results from the Minimum Floodplain Habitat Report (SJRRP 2012) for available suitable rearing and migration habitat. The total inundated area in Tables 8-2 and 8-3 is much larger than the area of suitable habitat because criteria in addition to inundation determine the suitability of rearing and migration habitat. In the Minimum Floodplain Habitat Report, suitable rearing (and migration) habitat was defined by acceptable cover, velocity, and depth criteria with a habitat suitability curve approach.

Table 8-2. Available Area of Suitable Habitat by Reach under Existing Conditions, for each Water Year Type (acres), Compared to Required Suitable Habitat

Reach	Water Year Type				
	Dry 1,000-1,500 cfs (20% of years)	Normal 2,180-2,500 cfs (60% of years)	Wet 3,600-4,500 cfs (20% of years)	Weighted Average Available Suitable Habitat (acres)	Daily Required Suitable Habitat to meet population targets (acres)
1B	67	56	59	59	109
2A	94	104	114	104	183
2B	--	--	--	--	144
3	45	65	71	60	203
4A	50	56	68	57	76
4B1	--	--	--	--	54
4B2	200	281	344	277	19
5	230	371	526	374	23

Table 8-2 presents the available suitable habitat by reach and water year type for the maximum flow that is sustained for at least two weeks during the Spring Pulse. The available suitable habitat was calculated by a weighted average of the suitable habitat of the dry, normal, and wet water year, assuming twenty percent of years are in the wet water year type, sixty percent of years are normal dry or normal wet, and twenty percent of years are dry. Table 8-2 also compares the existing available habitat to the required suitable habitat for the long-term growth population goals of 45,000 returning adult spring-run Chinook salmon and 15,000 returning adult fall-run Chinook salmon, assuming migration timing and speeds from other rivers.

The Reach 2B and Reach 4B projects coupled with Restoration Flows will add suitable rearing habitat and inundated area to the SJRRP area. Table 8-3 shows the total inundated area to be provided in different year-types by the two main floodplain projects. Depending on the restoration and revegetation designs and the success of the revegetation, one tenth to one quarter of this inundated area could be suitable habitat for juvenile rearing. The columns from left to right indicate the river reach, levee option, and total inundated area in acres for each of the water year types.

Table 8-3. Total Inundated Area by Water Year Type and Project Levee Options

Reach	Levee Option	*Total Inundated Area* (acres)		
		Dry	Normal	Wet
2B	Narrow	494	1,176	1,572
	Wide	549	1,496	1,983
	Existing	558	752	-
4B1	A	981	-	-
	B	2,228	2,756	2,847
	C	3,555	5,306	5,966
	D	5,473	7,309	9,173

8.3.4 Available Adult Holding Habitat

Adequate holding habitat is necessary in Reach 1 for spring-run Chinook salmon to survive throughout the summer months to spawn in September and October. Because of their life history strategy, adult spring-run enter natal streams in the early spring, then hold in cool, relatively deep, and slower velocity water conserving energy while sexually maturing. The preliminary estimates provided by Stillwater (2003) and additional analyses by the Program indicate that adult holding habitat will not limit salmon population establishment in the near future and may not be a limiting factor at all. Based on an assumed need of one square meter per adult, a total of 30,000 square meters would be required to provide adequate holding habitat.

The Adult Migration Small Interdisciplinary Group is refining estimates of adult holding habitat that will include physical measurements within the system and evaluation of potential temperatures across water year types, and will compile this information into a report by May 2016. The Program will also monitor returning spring-run salmon during initial returns to evaluate holding habitat use and the survival of spring-run salmon holding within the system.

Table 8-4 provides the area from Friant Dam and Highway 41 that meets the holding habitat depth criteria of greater than or equal to five feet. Table 8-5 provides the area from Friant Dam and Highway 41 that meets the holding habitat depth criteria of greater than or equal to five feet and velocities of 0.5 to 1.2 feet per second.

Table 8-4. Area Meeting Holding Habitat Depth criteria (≥ 5 feet) between Friant Dam and Highway 41

Discharge (cfs)	Area (acres)	Area (m^2)
350	147	594,322
700	190	768,753
1,200	230	928,769
4,500	395	1,597,397
7,650	633	2,562,033

Table 8-5. Area Meeting Holding Habitat Depth (5 feet) and Velocity (0.5-1.2 feet/second) Criteria between Friant Dam and Highway 41

Discharge (cfs)	Area(acres)	Area (m^2)
350	60	244,452
700	97	392,144
1,200	75	302,587
4,500	58	233,170
7,650	91	369,132

8.3.5 Capacity and Production at the Salmon Conservation and Research Facility

In addition to river improvement projects, another large scale infrastructure investment being pursued by the SJRRP is the construction of the Conservation Facility. This facility will provide

the SJRRP with a supply of juvenile spring-run that will be the foundation of establishing a spring-run population in the Restoration Area. The Conservation Facility will maintain a captive broodstock, established from salmon collected from donor stocks, to produce juvenile spring-run for release into the Restoration Area. The use of a captive broodstock will allow the SJRRP to release a large number of juvenile spring-run salmon into the system while only collecting a small number of individuals from the donor populations. Although the facility is not expected to be completed until the end of 2017, the SJRRP has already begun the establishment of a captive broodstock at a temporary facility known as the Interim Conservation Facility.

Currently, the broodstock at the Interim Conservation Facility consists of individuals collected from the Feather River Fish Hatchery, but the long term objective of the SJRRP is to develop a genetically diverse captive broodstock developed from multiple donor stocks, including extant wild stocks in the Central Valley of California (SJRRP 2010). The SJRRP is working with fishery managers to determine appropriate methods and conditions for collecting from these stocks. The USFWS plans to pursue the appropriate permits to proceed with these collections.

Table 8-6 lists the projected production capacity of juveniles from Interim Conservation Facility and Conservation Facility that will be available to the Program to work towards establishing spring-run populations in the Restoration Area. Actual release numbers may vary from this projected capacity for a number of reasons. The estimates of numbers of juveniles are based on estimates of fecundity, spawning success, and egg survival. These numbers assume the Conservation Facility will be completed according to the current schedule. Any construction delays could reduce juvenile numbers due to capacity constraints at Interim Conservation Facility. Also, the Program is implementing spring-run reintroduction through an adaptive process. Information gained over time will influence decisions on the releases of fish. For example, the SJRRP may modify actual release rates based on the conditions in the system such as the adequacy of adult passage at facilities.

Table 8-6. Production Capacity of the Salmon Conservation and Research Facility and Hatchery Return Estimates

Brood Year	Release Year	Estimated Juvenile Release from Feather River Fish Hatchery[1]	Estimated Juvenile Release from Salmon Conservation and Research Facility	Estimated Hatchery Fish Return (Mean)	Estimated Hatchery Fish Return (95%[2])
2013	2014	54,400	--	--	--
2014	2015	54,400	--	0	0
2015	2016	60,800	120,000	21	62
2016	2017	60,800	151,875	61	142
2017	2018	60,800	200,000	98	237
2018	2019	60,800	600,000	186	441
2019	2020		700,000	238	535
2020	2021		960,000	418	966
2021	2022		1,260,000	721	1,641
2022	2023		1,440,000	891	2,018
2023	2024		1,440,000	1,196	2,708
2024	2025		1,440,000	1,533	3,358
2025	2026		1,440,000	1,667	3,690

1. Estimated releases from the Feather River Fish Hatchery are based on the collection of 80,000 eggs and projected survival except for 2013 and 2014 when 54,400 juveniles would be collected from the Feather River Fish Hatchery as is defined in the 10(a)(1)(A) permit application.
2. The 95% level is the mean of the top 5% of projection runs, and is meant to represent an optimistic projection of returns from SJRRP actions.

8.4 Salmon Establishment During the Five Year Visions

The physical project actions and reintroduction activities outlined in this Revised Framework should generally 'ratchet up' in parallel. For example, it is expected that channel capacity improvements, juvenile rearing opportunities, and reintroduction activities will all increase together. Not all actions, improvements, and activities will be perfectly sequenced, particularly since some of the project actions will result in a 'step function' (a large and immediate increase) in channel capacity or juvenile rearing habitat, whereas salmon population dynamics will be partially driven by factors outside the Restoration Area in addition to conditions within the system. However, appropriate sequencing will help to ensure a logical progression so that no one area of improvement vastly outstrips another.

The following section provides an overview of project timing, resulting system flow and physical capacity, and reintroduction actions and results. Table 8-7 summarizes the Revised Framework

including (from left to right), the following: (a) project phases / timeline in the five year period; (b) major flow and channel related projects with implications for reintroduction; (c) river condition and capacity to support reintroduction and salmon population establishment, including conveyance capacity, upstream and downstream passage, rearing, holding, and spawning habitat extent; and, (d) reintroduction status, including program reintroduction actions and anticipated juvenile and adult production estimates for growing populations of spring-run and fall-run Chinook salmon.

8.4.1 Five Year Vision (FY 2015 to 2019)

During this time period, the Compact Bypass component of the Mendota Pool Bypass and Reach 2B Project will be completed, passage at key barriers in the Eastside Bypass will be completed, and seepage and levee stability projects to allow 1,300 cfs will be completed. Fish actions and expectations will need to account for the limitations on salmon to complete their life history. Flows within the Restoration Area are expected to increase throughout this five year vision, incrementally improving general conditions for salmon. Despite the limitations, the conditions in the upper reaches should allow for successful spawning, egg incubation, and juvenile rearing, and the SJRRP will pursue migratory assistance for adult salmon and may pursue assistance for juvenile salmon. This period also presents an opportunity to evaluate a variety of data gaps, including questions relating to relative spawn timing of spring-run and fall run, testing methods to avoid hybridization, determining the potential for introgression (in a preventative and protective manner), and measuring growth rates of spring run and fall run juveniles, among other actions.

Despite some key uncertainties for progress toward building fall-run and spring-run salmon populations during this time period, it is still valuable for the SJRRP to pursue reintroduction actions. Establishing salmon populations is a long term process, and several questions still exist that can best be answered by observing fish within the system. For example, observing when and where spring-run and fall-run salmon spawn will allow the SJRRP to evaluate the need and ability to take actions to segregate the runs to limit genetic introgression. Observing adult and juvenile habitat selection will help the SJRRP refine the estimates of available habitat. Having salmon in the system will also allow the SJRRP to evaluate potential population limiting losses from juvenile mortality, adult false migration pathways, or other sources. This information will help the SJRRP prioritize future actions and flow management to expedite the process towards longer term objectives. During this time period, the SJRRP will be simultaneously trying to establish populations under current conditions while informing the SJRRP to increase the probability of long term success.

Progress towards establishing salmon populations will be dependent on water conditions. Just as low water years can impact populations in a restored river, wet year conditions in the system can provide successful juvenile migration and survival.

The Program anticipates continuing with the spring-run salmon juvenile releases that began in 2014, and larger juvenile releases from production at Interim Conservation Facility beginning in 2016, and from Conservation Facility for 2018 and beyond. Juveniles would initially be released low in the system to avoid passage constraints and high mortalities, but locations may be adjusted depending on water year and the results of juvenile survival studies. The Program will be prepared to capture and transport any returning spring-run salmon adults beginning in the

spring of 2016. The Program will also continue to transport fall-run salmon to Reach 1 to allow natural spawning, and a portion of the fish will be streamside spawned and reared in order to produce juveniles for use by the SJRRP. A major challenge during this period will be the ability for juveniles to migrate out of the system unassisted. The SJRRP will continue to evaluate the ability to trap and haul juvenile salmon.

Flow capacity is expected to increase incrementally between 2015 and 2019 which may provide the ability for juvenile salmon to migrate out of the Restoration Area unassisted. However, survival rates will likely increase as flow capacity and screening projects are completed. As flow connectivity is established and flow levels increased, the Program will study juvenile migratory survival to help inform future actions, such as when to implement juvenile trapping actions and determining the release location for hatchery-produced juveniles. These evaluations will also inform expectations of population building from releases and natural spawning.

Habitat carrying capacity is not expected to be limiting for any life history stage prior to 2019 based on prior analyses. Ongoing efforts will continue to complete robust analyses on habitat needs and time frames. The SJRRP expects to produce reports on the available habitat in the Restoration Area and the amounts needed over time to support fish population objectives for spawning, juvenile rearing and adult holding habitat in 2016 to inform future planning. Completing these analyses early in the Five Year Vision will allow the SJRRP to identify potential limiting factors that can be addressed prior to impacting progress toward achieving population targets.

To develop a genetically diverse captive broodstock from multiple donor stocks, including extant wild stocks in the Central Valley of California (SJRRP 2010), the SJRRP needs to work with fishery managers to determine appropriate methods and conditions for collecting from these stocks. The USFWS plans to pursue the appropriate permits to proceed with these collections within the Five Year Vision.

8.4.2 Ten Year Vision (FY 2020 to 2024)

Following the Five Year Vision, a number of actions will be completed that will significantly improve conditions for establishing salmon populations within the Restoration Area during the Ten Year Vision. The actions scheduled to be completed by 2019 would provide flows up to Reach 2B capacity of at least 1,300 cfs, and provide passage for adult salmon and greatly reduce juvenile migratory mortality in the area of the Mendota Pool. The completion of the Conservation Facility will provide the SJRRP with the capacity to increase spring-run juvenile production and releases, and pending permitting decisions, increase the genetic diversity of captive brood stock through the collection of wild stocks. During this time period, salmon should be able to complete their life history with little direct human assistance, but the SJRRP will continue to monitor success to tailor actions or provide assistance as necessary.

During the first few years of the Ten Year Vision, the SJRRP expects several hundred spring-run adults to return from the juvenile releases plus additional adult returns from natural spawning of both fall-run and spring-run salmon. Although the objective is to provide conditions for volitional passage, the SJRRP will monitor passage and provide assistance through trap and haul if necessary due to inadequacy of passage solutions, conditions caused by poor water years, or false migration pathway losses (e.g., Salt and Mud sloughs). The results of these assessments

will also inform the SJRRP's release numbers of spring-run juveniles based on the SJRRP's confidence in passage conditions or capacity of the trap and haul program.

Once in Reach 1, the SJRRP expects the adult salmon to have an adequate supply of adult holding and spawning habitat. The SJRRP will have completed the assessments of habitat quantity and quality, updated population targets, and observations of habitat selection to determine if habitat improvement or augmentation is likely to remove limits to population growth. The production capacity of the Conservation Facility will increase during this time period and is scheduled to reach full capacity for spring 2023 releases. Increased channel capacity, the completion of the Mendota Pool Bypass, and the completion of the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project by the end of FY 2022 will allow the SJRRP to release juveniles further up in the Restoration Area than in previous years. The exact locations will be determined based on the then-current understanding of migration conditions. Given the time lag of juvenile releases to adult returns, the increase in capacity and releases from the Conservation Facility coincides with the completion of major projects.

The combination of increased channel capacity, the completion of the Mendota Pool Bypass, and the completion of the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project are expected to provide conditions for volitional juvenile migration with higher rates of survival. Juvenile survival studies from prior years and evaluations of juvenile trap and haul methods will help provide an estimation of migration survival rates. These evaluations will also help determine if other management actions would benefit juvenile migration survival, such as predation reduction efforts and habitat improvements. Included in these evaluations is completing the necessary assessments of biological criteria for the prioritization of gravel pits.

Depending on the quantity of habitat provided from progress on the Mendota Pool Bypass, Reach 2B Improvements Project and population growth levels, juvenile production numbers may reach levels exceeding habitat capacity during this time period. Completion of a habitat planning effort that relies on existing habitat assessments and updated population targets will be completed in the Five Year Vision. This report along with population status assessments will better inform the Program on the potential of rearing habitat to become limiting during this time period.

8.4.3 Fifteen Year Vision (FY 2025 to 2029)

At the beginning of this time period, the Program will have made major progress in providing conditions for the ability of salmon to complete their life history and to successfully establish salmon populations. Channel capacity is projected to allow 2,500 cfs of flow throughout the system and up to 4,500 through Reach 2B. Passage and screening, if determined necessary, will be completed at Mendota Pool, Arroyo Canal, and Sack Dam, and channel and structural improvements will have been completed in Reach 2B.

The SJRRP expects adult fall-run and spring-run salmon to be able to migrate volitionally during this time period. The SJRRP does not expect to provide adult migration assistance through trap and haul, but will be prepared to assist if necessary. Based on observations in prior years, the SJRRP may still need to trap adults in false migration pathways, but this straying will likely be reduced with the completion of the seasonal barriers on Salt and Mud sloughs scheduled for FY 2025 and the increased flow capacity of the main stem San Joaquin River. The Program should

have several years of observations with both fall-run and spring-run salmon in the system to determine if action is needed to manage introgression or competition between the two runs, and will determine the appropriate strategy to employ.

As discussed above, it is difficult to predict adult return numbers into the future, but the SJRRP should be prepared for several thousand wild and hatchery adult returns of fall-run and spring-run salmon (see Table 8-7), but will adjust these numbers accordingly based on targets developed during the Five Year Vision and population performance up to this time period. During the Fifteen Year Vision, returning spawners may exceed the available spawning habitat. This will be better understood after the Program evaluates the available spawning habitat area compared to population targets during the Five Year Vision, along with subsequent observations of population performance and habitat use.

The Program will continue to release spring-run juveniles from the Conservation Facility that are consistent with meeting population targets. During this time period, the SJRRP will develop a strategy for determining how or when to phase out use of the Conservation Facility for spring-run salmon.

The SJRRP expects juvenile survival and growth rates to continue to improve during the Fifteen Year Vision through increasing flow capacity, completion of the Reach 4 project, and gravel pit remediation efforts. Juvenile production numbers may reach levels exceeding rearing habitat capacity during this time period, but that will be better understood after completion of habitat planning efforts, and updated population targets that will be completed in the Five Year Vision along with subsequent observations of population performance and habitat use.

The Program will continue to assess success towards meeting the Restoration Goal and determine mechanisms that may impede success (e.g., predation mortality, survival downstream of the Merced River and in the ocean) to inform the consideration of any Paragraph 12 actions by the Restoration Administrator.

8.5 Beyond Fifteen Years Vision (FY 2030+)

It is difficult to predict the specific status for population establishment or specific actions that will be conducted during this time period, as actions at this time will largely be based on future decisions, evaluations of prior actions, and the progress towards establishing naturally-reproducing and self-sustaining runs of spring-run and fall-run Chinook salmon. Monitoring of the salmon populations will continue to assess status and inform future actions including the process for phasing out use of the Conservation Facility. Continued monitoring will inform the status of salmon restoration, and will determine if further research is necessary to uncover limiting factors and inform any future actions not currently described in this Framework.

8.6 Future Fish Planning

The SJRRP is implementing an adaptive program for establishing salmon to the Restoration Area. Monitoring will inform the program on the success of actions, and strategies will be

continually adjusted based on current information. Currently the SJRRP has several technical efforts ongoing that will inform future efforts. By spring 2016, the Program expects to have updated population targets that account for the timeframes included in this Revised Framework and further analyses of juvenile trapping efforts.

The SJRRP is conducting a process to resolve issues among involved parties. This process began with a two day session in early May 2015 and will include two more meetings in 2015. The results of these discussions, along with the results of technical analyses, will be the basis for developing a Fisheries Framework for Implementation by May 2016. After completion of this Fisheries Framework, the SJRRP will continue to implement an adaptive management strategy that involves continual monitoring of program success and limiting factors. As new information becomes available, the SJRRP will adjust strategies and may pursue additional actions to alleviate limitations on meeting population objectives.

Table 8-7. Summary of Framework for Reintroduction

Phase	Projects	System Condition/ Capacity			Reintroduction		
Year	**Action**	**Channel Capacity**	**Passage**	**Habitat Extent[T]**	**Reintroduction Actions**	**Fall-run Production Estimates***	**Spring-run Production Estimates***
2015-2019	*Phase 1* • Mendota Pool Bypass • Seepage Actions to at least 1,300 cfs • Levee Stability Actions to at least 1,300 cfs	0-1,300 cfs	*Juvenile fall-run & spring-run:* • Pursue trap and haul as needed (evaluate) • Volitional outmigration (with higher flows) *Adult fall-run & spring-run:* • Annual trap and haul from various locations (Hills Ferry Barrier, Sack Dam, Salt and Mud Sloughs, Mendota Pool)	Rearing: • Potential need for additional 32 acres beyond existing by 2019 will likely be supplied by Mendota Bypass Project completion Spawning: • Sufficient for this phase Holding: • Sufficient for this phase	• Conservation Facility & Water Supply Line Construction, O&M • Increase Donor Stock Collection up to 2700 eggs or juveniles, diversify with wild stocks • Broodstock production and release of spring-run juveniles • Genetics Monitoring • Trap and haul adults as needed • Evaluate fall-run interaction with spring-run and need for spring-run protective measures • Evaluate need for Basin Fall-run Management Plan • Evaluate Hills Ferry Barrier and/or other structures to address San Joaquin River basin and SJRRP objectives	*Adult* • Variable numbers 200-500 expected. *Juvenile* • Natural production from translocated adults • Streamside rearing production	*Adult* • 62-535 (*95%, Near-term Reintroduction Plan*) *Juvenile* • 54,000 - 760,800 (Total released, combined sources, Near-term Reintroduction Plan)

Table 8-7. Summary of Framework for Reintroduction

Phase	Projects	System Condition/ Capacity			Reintroduction		
Year	**Action**	**Channel Capacity**	**Passage**	**Habitat Extent[Ŧ]**	**Reintroduction Actions**	**Fall-run Production Estimates***	**Spring-run Production Estimates***
2020-2024	*Phase 1* • Reach 2B Capacity • Arroyo Canal Fish Screen and Sack Dam Fish Passage • Seepage Actions to 2,500 cfs • Levee Stability Actions to 2,500 cfs • Salt and Mud Slough Seasonal Barriers	1,300-2,500 cfs	*Juvenile fall-run & spring-run* • Volitional outmigration in all but low water years • Trap and haul as needed (low water years, research) *Adult fall-run & spring-rim* • Volitional passage through all major barriers • Trap and haul as needed (low flows, false pathways)	Rearing: • Need additional 270 acres beyond existing by 2019 – may be met by Reach 2B Project Spawning: • Likely sufficient for this phase Holding: • Likely sufficient for this phase	• Conservation Facility O&M • Donor Stock Collection, including wild stocks if needed • Evaluate need for Feather River Fish Hatchery spring-run translocation • Broodstock production and release of spring-run juveniles • Genetics Monitoring • Trap and haul of adults, as needed • Adapt operation of Hills Ferry Barrier or other structures to address both San Joaquin River Basin and SJRRP fall-run objectives	*Adult* • Variable numbers based on returns *Juvenile* • Natural production from returning adults • Potential streamside rearing production	*Adult* • 535-4,317 (*95%, Near-term Reintroduction Plan*) • Minimum adult population target (500) *Juvenile* 54,000 - 1,500,800 (Total released, combined sources, Near-term Reintroduction Plan) • Wild Production

Table 8-7. Summary of Framework for Reintroduction

Phase	Projects	System Condition/ Capacity			Reintroduction		
Year	**Action**	**Channel Capacity**	**Passage**	**Habitat Extent[Ŧ]**	**Reintroduction Actions**	**Fall-run Production Estimates***	**Spring-run Production Estimates***
2025-2029	• O&M of all constructed facilities • Reach 4B/ESB/MB Channel and Structural Improvements • Seepage Actions, Levee Stability Actions to 4,500 cfs *Phase 2 – as funding allows* • Chowchilla Bifurcation Structure Fish Passage • Gravel Pit Filing and/or Isolation	2,500 – 4,500 cfs	*Juvenile fall-run & spring-run* • Volitional outmigration in all but low water years • Trap and haul as needed (low water years, research) *Adult fall-run & spring-run* • Volitional passage through all major barriers	*Need beyond existing by 2030* Additional • Habitat needed beyond current levels Spawning: • May need additional habitat Holding: • Likely sufficient for this phase	• Conservation Facility O&M • Donor Stock Collection*, as* needed; shift collections to within SJR/hatchery system • Cease Feather River Fish Hatchery spring-run translocation • Broodstock production and release of spring-run juveniles • Genetics Monitoring • MAP projects and Monitoring • Implement SJRRP to support SJR Basin salmon plan/strategy	*Adult* • Variable numbers above baseline based on returns *Juvenile* • Natural production from returning adults • Potential streamside rearing production	*Adult* • 5,014+ (*95%, Near-term Reintroduction Plan*) • *Minimum population threshold (500)* *Juvenile* • 1,500,800 (Total released, combined sources, Near-term Reintroduction Plan) • Wild Production

Notes:

- 95% Production estimates for SR Salmon from *Near and Mid-Term Salmon Reintroduction Plan* (SJRRP, 2014b)
- Rearing Habitat needs acreage calculated based on adult production estimates as percentage of long term population goal, and habitat targets for long term population goals from *Minimum Floodplain Habitat Area For Spring And Fall-Run Chinook Salmon* (SJRRP, 2012)
- *The Program is pursuing a process to determine interim projections of expected population sizes for all life stages of both spring-run and fall-run based on the expected river conditions described in the Revised Framework. Placeholders or existing numbers are included in the table to illustrate the link between planning and population status and our existing information where applicable.
- The Program expects to complete refined assessments of available habitat and habitat needed to support population targets in 2016.

This page left intentionally blank

9.0 References

American Society of Farm Managers and Rural Appraisers (ASFMRA), California Chapter. 2013 Ag Land Trends Report.

California Department of Water Resources. 2011. Preliminary fish passage assessments of Reaches 1 and 2 of the San Joaquin River and the Chowchilla Bypass channel. Fresno, California.

Deister, Ane. 2008. Recommendations on Restoring Fall-run Chinook Salmon to the Upper San Joaquin River. February. Prepared by the San Joaquin River Restoration Program, Technical Advisory Committee.

Meade, Roderick J. 2007. Recommendations on Restoring Spring-run Chinook Salmon to the Upper San Joaquin River. October. Prepared by the San Joaquin River Restoration Program, Technical Advisory Committee.

San Joaquin River Restoration Program (SJRRP). 2010. Fisheries Management Plan: A Framework for Adaptive Management in the San Joaquin River Restoration Program.

SJRRP. 2011. Fish Passage Assessment for Mariposa Bypass, Eastside Bypass and Reach 4a San Joaquin River Restoration. Program Draft Technical Memorandum. August 2011.

SJRRP. 2012. Minimum Floodplain Habitat Area For Spring And Fall-Run Chinook Salmon. November.

SJRRP. 2013. Draft Guidance Document on the Management of Paragraph 13(i) Unreleased Restoration Flows. September 2013.

SJRRP. 2014a. Juvenile Chinook Salmon Trap and Haul Analysis. March 2014

SJRRP. 2014b. Near and Mid-Term Salmon Reintroduction Plan.

Stillwater Sciences. 2003. Restoration Objectives of the San Joaquin River. March.

The Reclamation Board. 1967. Operation and Maintenance Manual for Levee, Irrigation and Drainage Structures, Channels and Miscellaneous Facilities for the Lower San Joaquin River Flood Control Project.

This page left intentionally blank