

Environmental Assessment

Invasive Vegetation Monitoring and Management

SAN JOAQUIN RIVER
RESTORATION PROGRAM



This page left blank intentionally.

Table of Contents

1.0	Introduction and Statement of Purpose and Need.....	1-1
1.1	Introduction.....	1-1
1.2	Document Organization	1-1
1.3	Purpose and Need for the Proposed Action.....	1-2
1.3.1	Project Background	1-2
1.3.2	Statement of Purpose and Need for Proposed Action	1-3
1.4	Purpose of This Document and Regulatory Guidance	1-4
1.4.1	National Environmental Policy Act	1-4
1.5	Study Area.....	1-5
2.0	Description of Alternatives.....	2-1
2.1	No-Action Alternative	2-1
2.2	Proposed Action	2-3
2.2.1	Invasive Plant Removal.....	2-7
2.2.2	Timing	2-10
2.2.3	Planting.....	2-10
2.2.4	Environmental Commitments.....	2-11
2.3	Relationship to Related Projects	2-21
3.0	Affected Environment and Environmental Consequences	3-1
3.1	Biological Resources	3-1
3.1.1	Affected Environment	3-1
3.1.2	Environmental Consequences	3-2
3.2	Water Quality & Hydrology	3-2
3.2.1	Affected Environment	3-2
3.2.2	Environmental Consequences	3-3
3.3	Cultural Resources	3-4
3.3.1	Affected Environment	3-4
3.3.2	Environmental Consequences	3-6

3.4 Indian Trust Assets	3-7
3.4.1 Affected Environment.....	3-7
3.4.2 Environmental Consequences.....	3-7
3.5 Socioeconomic Resources.....	3-8
3.5.1 Affected Environment.....	3-8
3.5.2 Environmental Consequences.....	3-8
3.6 Environmental Justice	3-8
3.6.1 Affected Environment.....	3-8
3.6.2 Environmental Consequences.....	3-9
3.7 Air Quality	3-9
3.7.1 Affected Environment.....	3-9
3.7.2 Environmental Consequences.....	3-10
3.8 Aesthetics	3-10
3.8.1 Affected Environment.....	3-10
3.8.2 Environmental Consequences.....	3-13
3.9 Hazards and Hazardous Materials	3-13
3.9.1 Affected Environment.....	3-13
3.9.2 Environmental Consequences.....	3-14
3.10 Noise.....	3-14
3.10.1 Affected Environment.....	3-14
3.10.2 Environmental Consequences.....	3-15
3.11 Environmental Consequences Analysis	3-15
3.11.1 Resource Topics Not Requiring Further Evaluation.....	3-16
3.12 Cumulative Impacts.....	3-17
4.0 Consultation and Coordination.....	4-1

4.1	National Environmental Policy Act.....	4-1
4.2	Fish and Wildlife Coordination Act of 1934 (16 USC § 661 et seq.)	4-1
4.3	Endangered Species Act of 1973 (16 USC § 1531 et seq.)	4-1
4.4	Magnuson-Stevens Fishery Conservation and Management Act	4-1
4.5	National Historic Preservation Act (16 USC § 470 et seq.).....	4-2
4.6	Migratory Bird Treaty Act of 1918 (16 USC § 703 et seq.)	4-2
4.7	Executive Order 113007 and American Indian Religious Freedom Act of 1978 – Indian Trust Assets and Sacred Sites on Federal Lands	4-3
4.8	Executive Order 12898 – Environmental Justice in Minority and Low-Income Populations	4-3
4.9	Central Valley Project Improvement Act.....	4-3
4.10	Additional Implementation Considerations.....	4-3
	4.10.1 Access.....	4-3
	4.10.2 Implementation Coordination.....	4-4
5.0	Errata.....	5-1
5.1	Section 1 – Purpose and Need for Action.....	5-1
5.2	Section 2 – Description of Alternatives	5-2
5.3	Section 3 – Affected Environment and Environmental Consequences	5-6
5.4	Section 4 – Consultation and Coordination	5-7
6.0	List of Preparers and Contributors.....	6-1
7.0	Literature Cited.....	7-1

Appendices

Appendix A – Invasive Species Management and Monitoring Project Maps

Appendix B – Comments Received

Tables

Table 2-1. Invasive Vegetation Monitoring and Management Project Activities.....	2-4
Table 2-2 Summary of herbicides and use within the proposed action area.....	2-8
Table 2-3 Surfactants proposed for use with the herbicides listed in Table 2-2	2-9
Table 3-1.....	3-2
Listed Species and Critical Habitat Potentially Present in the Proposed Action Area.....	3-2
Table 3-2. Summary of Cultural Resources Results by Reach	3-5

Figures

Figure 1-1. Study Area: San Joaquin River Reaches and Flood Bypass System in the Restoration Area.....	1-6
Figure 2-1. 2008 San Joaquin River Invasive Vegetation Locations	2-2

List of Abbreviations and Acronyms

Act	Endangered Species Act
ATR	Annual Technical Report
ATV	all-terrain vehicle
BA	Biological Assessment
Banks	Harvey O. Banks Pumping Plant
BNLL	Blunt Nose Leopard Lizard
BO	Biological Opinion
CCR	California Code of Regulations
DFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CTS	California tiger salamander
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
Delta	Sacramento-San Joaquin Delta
D-1641	Water Rights Decision 1641
DMC	Delta Mendota Canal
DO	Dissolved Oxygen
DPR	California Department of Pesticide Regulation
DPS	distinct population segment
DWR	Department of Water Resources
EA	Environmental Assessment
EA/IS	Environmental Assessment/Initial Study
EFH	Essential Fish Habitat
ESA	Environmentally Sensitive Area
ESU	evolutionarily significant unit
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact

San Joaquin River Restoration Program

FONNSI	Finding of No New Significant Impact
GGS	giant garter snake
IS	Initial Study
Jones	C.W. Bill Jones Pumping Plant
LBC	least Bell's vireo
MND	Mitigated Negative Declaration
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NOP	Notice of Preparation
NRDC	Natural Resources Defense Council
NTU	Nephelometric Turbidity Unit
PEIS/R	Program Environmental Impact Statement/Report
Proposed Action	Invasive Vegetation Monitoring and Management Project
Project	Invasive Vegetation Monitoring and Management Project
RA	Restoration Administrator
RP	River Partners
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROD	Record of Decision
RPA	Reasonable and Prudent Alternative
Secretary	U.S. Secretary of Interior
Service	U.S. Fish and Wildlife Service
Settlement	Stipulation of Settlement in <i>NRDC, et al. v. Kirk Rodgers, et al.</i>
SJKF	San Joaquin kit fox
SJR	San Joaquin River
SJRRP	San Joaquin River Restoration Program
State	State of California
SMND	Subsequent Mitigated Negative Declaration
SWP	State Water Project

SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
Trust	San Joaquin River Parkway and Conservation Trust
TNC	The Nature Conservancy
TAF	Thousand Acre-Feet
μ/L	Micrograms per Liter
USC	United States Code
USGS	U.S. Geological Survey
VAMP	Vernalis Adaptive Management Plan
VELB	Valley elderberry longhorn beetle
WF	willow flycatcher
WY	Water Year
YBC	Yellow-billed Cuckoo

This page left blank intentionally.

1.0 Introduction and Statement of Purpose and Need

1.1 Introduction

The San Joaquin River Restoration Program (SJRRP) was established in late 2006 to implement the Stipulation of Settlement in *NRDC, et al. v. Kirk Rodgers, et al.* (Settlement). The U.S. Department of the Interior, Bureau of Reclamation, modified releases from Friant Dam beginning in Water Year (WY) 2010 (October 1, 2009, to September 30, 2010) to meet Settlement requirements. The Settlement terms Interim Flows as water releases from Friant Dam prior to release of full Restoration Flows. Reclamation, as the lead agency under the National Environmental Policy Act (NEPA), and the California Department of Water Resources (DWR), as the lead agency under the California Environmental Quality Act (CEQA) prepared an Environmental Assessment/Initial Study (EA/IS) to evaluate activities necessary to convey the flows in the San Joaquin River, from Friant Dam to the Sacramento-San Joaquin Delta (Delta), and to conduct data collection and monitoring activities during Interim Flow releases during WY 2010. Reclamation approved the Finding of No Significant Impact (FONSI), and DWR adopted the Mitigated Negative Declaration (MND) on September 25, 2009.

In Appendix F of the *WY 2010 Interim Flows Project EA/IS*, the *WY 2011 Interim Flows Project Supplemental EA*, and the *WY 2012 Interim Flows Project Supplemental EA* Reclamation made an environmental commitment to monitor and manage invasive vegetation with potential to compromise successful implementation of SJRRP. On September 26, 2011 Reclamation entered into a grant with the San Joaquin River Parkway and Conservation Trust (Trust) to meet this commitment.

This EA analyzes the SJRRP Invasive Vegetation Monitoring and Management Project (Project or Proposed Action). Reclamation will fund the Project and serve as the lead agency under NEPA.

1.2 Document Organization

This EA is divided into the following sections:

- **Section 1, Introduction and Statement of Purpose and Need**, introduces the Proposed Action, and provides background information; describes the purpose of and need for the Proposed Action; discusses the purpose of the EA; provides study area information; and describes document organization.
- **Section 2, Description of Alternatives**, describes the No-Action Alternative and the Proposed Action.

- **Section 3, Affected Environment and Environmental Consequences** describes the environmental setting, the impact analysis methodology, and the analytical results.
- **Section 4, Consultation and Coordination** describes the public involvement in the NEPA review process.
- **Section 5, List of Preparers** presents the agency staff directly responsible for preparing or reviewing this document.
- **Section 6, Literature Cited** lists references cited..

Appendices to this EA, providing pertinent supporting information and data used while preparing this document, are included as follows:

Appendix A- Invasive Species Management and Monitoring Project Maps

1.3 Purpose and Need for the Proposed Action

1.3.1 Project Background

In 1988, a coalition of environmental groups, led by the Natural Resources Defense Council (NRDC), filed a lawsuit challenging renewal of long-term water service contracts between the United States and Central Valley Project (CVP) Friant Division contractors. On September 13, 2006, the NRDC, Friant Water Users Authority (now known as Friant Water Authority), and the U.S. Departments of the Interior and Commerce (Settling Parties), agreed on the terms and conditions of the Settlement, which was subsequently approved by the U.S. Eastern District Court of California on October 23, 2006.

The Settlement establishes two primary goals:

- **Restoration Goal** – To restore and maintain fish populations in “good condition” in the main stem San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.
- **Water Management Goal** – To reduce or avoid adverse water supply impacts on all of the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided for in the Settlement.

The SJRRP will implement the Settlement and the Public Law 111-11 The “Implementing Agencies” responsible for managing and implementing the SJRRP include the U.S. Department of the Interior, through Reclamation and the U.S. Fish and Wildlife Service (Service), the U.S. Department of Commerce through the National Marine Fisheries Service (NMFS), and the State of California (State) Natural Resources Agency through DWR and the California Department of Fish and Game (DFG). The Settlement also stipulates the appointment of a Restoration Administrator (RA) to make recommendations to the U.S. Secretary of the Interior (Secretary), in consultation with a technical advisory committee, to help meet the Restoration Goal.

The Settlement identifies the releases of both Interim Flows and Restoration Flows. The Settlement stipulates the release of Interim Flows beginning no later than October 1, 2009, and continuing until full Restoration Flows begin on January 1, 2014, whichever occurs first. The intent of the Interim Flows release is to enable collection of relevant data on flows, temperatures, fish needs, seepage losses, and water recirculation, recapture, and reuse. Full Restoration Flows are described in Exhibit B of the Settlement that was provided as Appendix B of the final *WY 2010 Interim Flows Project EA/IS*.

Interim Flows rewetted portions of the San Joaquin River channel that were previously dry except during flood flows. The dry portions of the channel did not support substantial riparian vegetation, and the bare substrates are considered to be prone to recruitment of either native or invasive vegetation. Invasives could compromise the establishment of native habitat to support Chinook salmon and SJRRP's ability to achieve the Restoration Goal. Additionally, the release of Interim Flows could spread invasive species to other portions of the river. For this reason, the *WY 2010 Interim Flows Project EA/IS*, the *WY 2011 Interim Flows Project Supplemental EA*, and the *WY 2012 Interim Flows Project Supplemental EA* committed to monitoring and managing invasive vegetation.

As discussed earlier, Reclamation entered into a grant with the Trust, which is a member of the San Joaquin River Partnership (Partnership), to fulfill the commitments made in the *WY 2010 Interim Flows Project EA/IS*, the *WY 2011 Interim Flows Project Supplemental EA*, and the *WY 2012 Interim Flows Project Supplemental EA*. The Partnership includes 11 nonprofit member organizations and an array of scientists, volunteers, and conservationists who support full implementation of SJRRP by working with private landowners, government agencies, and community organizations. Three members of the Partnership, River Partners (RP), the Trust, and The Nature Conservancy (TNC), proposed to monitor and manage invasive vegetation in fulfillment of Reclamation's environmental commitments in the *Water Year 2010 EA and FONSI*, the *WY 2011 Interim Flows Project Supplemental EA*, and the *WY 2012 Interim Flows Project Supplemental EA*. Their previous successes in natural resources management have been a direct result of their ability to work in Central Valley communities to build coalitions and partnerships with federal, state and local agencies and other stakeholders. Their history of working with local communities is important, because they have engaged local youth, agricultural labor crews, and local students, to monitor and manage invasive plants on the river. These members view their involvement as an opportunity to address high unemployment in the San Joaquin Valley and reach out to the locals who are often unaware or uninformed about SJRRP.

1.3.2 Statement of Purpose and Need for Proposed Action

NEPA regulations require a statement of “the underlying purpose and need to which the agency is responding in proposing the alternatives, including the Proposed Action” (40 Code of Federal Regulations (CFR) 1502.13).

The purpose of the Proposed Action is to monitor and manage invasive vegetation along the San Joaquin River, focusing on giant reed (*Arundo donax*), sponge plant (*Limnobium spongia*), Chinese tallow (*Sapium sebiferum*), red sesbania (*Sesbania punicea*), and salt

cedar (*Tamarix sp.*), which have the potential to prevent successful implementation of the SJRRP. To contain the spread of invasive vegetation in response to Interim Flows, is necessary to treat existing infestations (where feasible) and support recruitment of native vegetation at specific sites. The two key objectives of the Proposed Action are as follows:

- Use weed monitoring protocols approved and used by Reclamation during the 2008 baseline invasive species studies and supplement the reporting protocols to extend the usefulness of weed monitoring data beyond the SJRRP's area of interest for the benefit of the entire San Joaquin River watershed; and
- Build a coordinated riparian weed management implementation framework for use in future San Joaquin Valley programs.

1.4 Purpose of This Document and Regulatory Guidance

This document identifies and discloses potential impacts of implementing the Proposed Action, in compliance with NEPA. Regulatory guidance on NEPA as it pertains to this document is summarized below.

1.4.1 National Environmental Policy Act

Section 10006 of Public Law 111-11 states, "In undertaking the measures authorized by this part, the Secretary and the Secretary of Commerce shall comply with all applicable Federal and State laws, rules, and regulations including NEPA and the [Endangered Species Act], as necessary."

Because Reclamation is funding Proposed Action, it is the lead agency under NEPA (40 CFR 1501.5).

Reclamation will comply with NEPA and the regulations published by the Council on Environmental Quality (CEQ), under 40 CFR 1500–1508, before initiating the Proposed Action. Also, this document is prepared consistent with U.S. Department of the Interior requirements specified in 43 CFR, Part 46 (U.S. Department of the Interior Implementation of NEPA, Final Rule). This document serves as an Environmental Assessment (EA) prepared in accordance with NEPA and associated Federal Guidelines. This EA was prepared with input from various disciplines and interested parties and includes sufficient evidence and analysis to determine whether an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI) is needed. As required under NEPA, this EA provides information describing the Proposed Action, alternatives, and related environmental consequences. Before Reclamation decides on the Proposed Action or another alternative, the EA will be available to public agencies and citizens for comment, during a 14-day public review period. After public review and comment, Reclamation intends to make a final decision regarding approval of the FONSI. Before approval, Reclamation will conclude consultation under Section 7 of the Federal Endangered Species Act of 1973, as amended (Act), to prevent the Proposed Action from jeopardizing listed species or destroying or adversely modifying designated critical habitat.

1.5 Study Area

The study area for this EA is the SJRRP Restoration Area that immediately surrounds the San Joaquin River and Flood Control Project from Friant Dam to the confluence of the Merced River. It includes areas that may be affected directly, indirectly, or cumulatively, by the Proposed Action (Figure 1-1). The San Joaquin River and flood bypasses within the Restoration Area are described as a series of physically and operationally distinct reaches as defined in Table 1-1. Table 1-1 also identifies the river reaches and bypasses included in the study area for this EA.

**Table 1-1
San Joaquin River Reaches and Flood Bypasses in the Restoration Area**

San Joaquin River Reaches and Flood Bypasses in Restoration Area				Restoration Area Reaches Included in Water Year 2012 Interim Flows Study Area
River or Bypass	Reach	Head of Reach or Bypass	Downstream End of Reach or Bypass	
San Joaquin River	1A	Friant Dam	State Route 99	✓
	1B	State Route 99	Gravelly Ford	✓
	2A	Gravelly Ford	Chowchilla Bypass Bifurcation Structure	✓
	2B	Chowchilla Bypass Bifurcation Structure	Mendota Dam	✓
	3	Mendota Dam	Sack Dam	✓
	4A	Sack Dam	Sand Slough Control Structure	✓
	4B1	Sand Slough Control Structure	Confluence with Mariposa Bypass	
	4B2	Confluence with Mariposa Bypass	Confluence with Bear Creek and Eastside Bypass	✓
	5	Confluence with Bear Creek and Eastside Bypass	Confluence with Merced River	✓
Chowchilla Bypass		Chowchilla Bypass Bifurcation Structure	Confluence with Fresno River and Eastside Bypass	
Eastside Bypass		Confluence with Fresno River and Chowchilla Bypass	Confluence with Bear Creek and San Joaquin River	✓
Sand Slough Bypass		Sand Slough Control Structure	Eastside Bypass	✓
Mariposa Bypass		Mariposa Bypass Bifurcation Structure	Confluence with San Joaquin River	✓

San Joaquin River Restoration Program

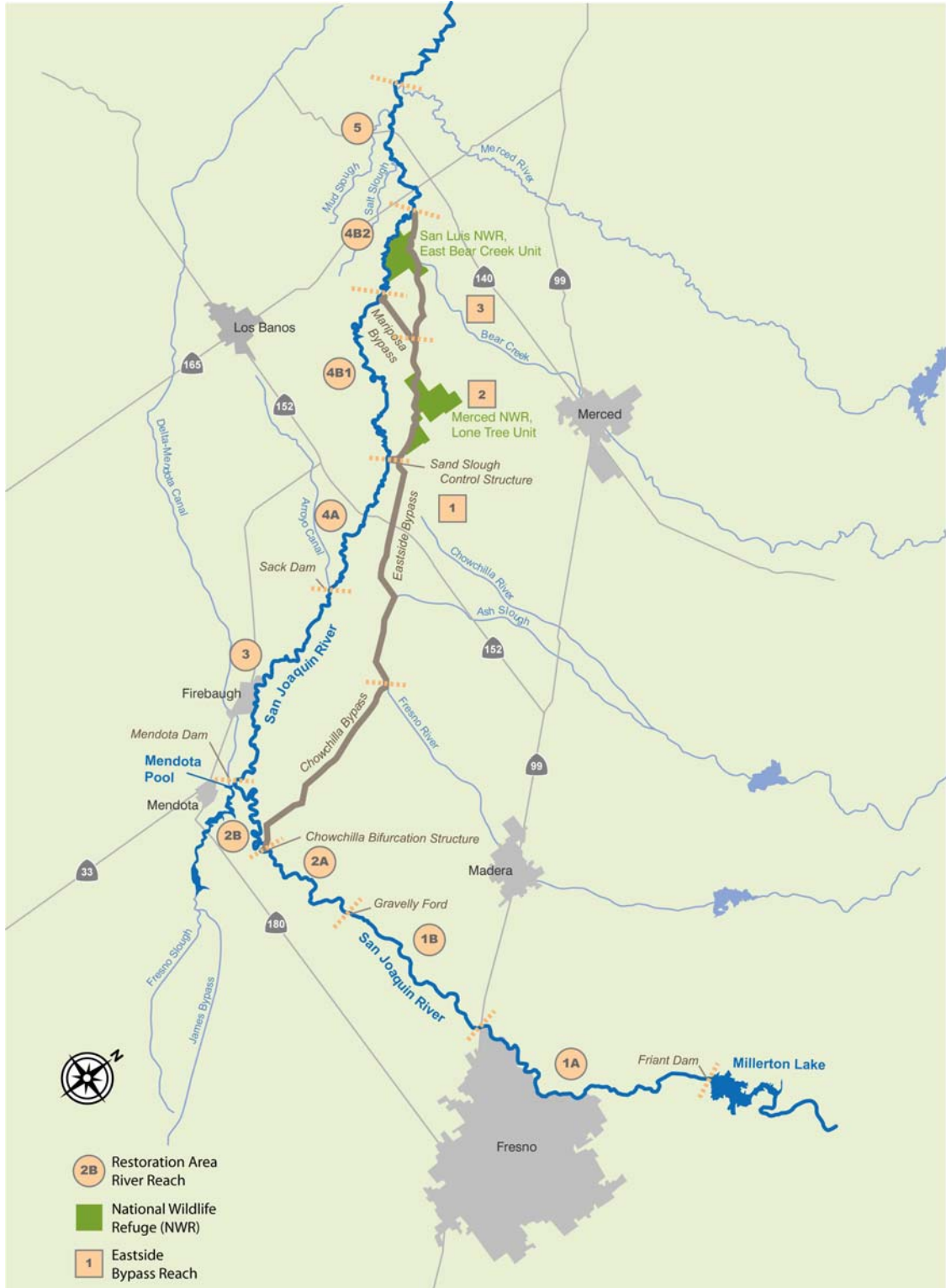


Figure 1-1.
Study Area: San Joaquin River Reaches and Flood Bypass System in the Restoration Area

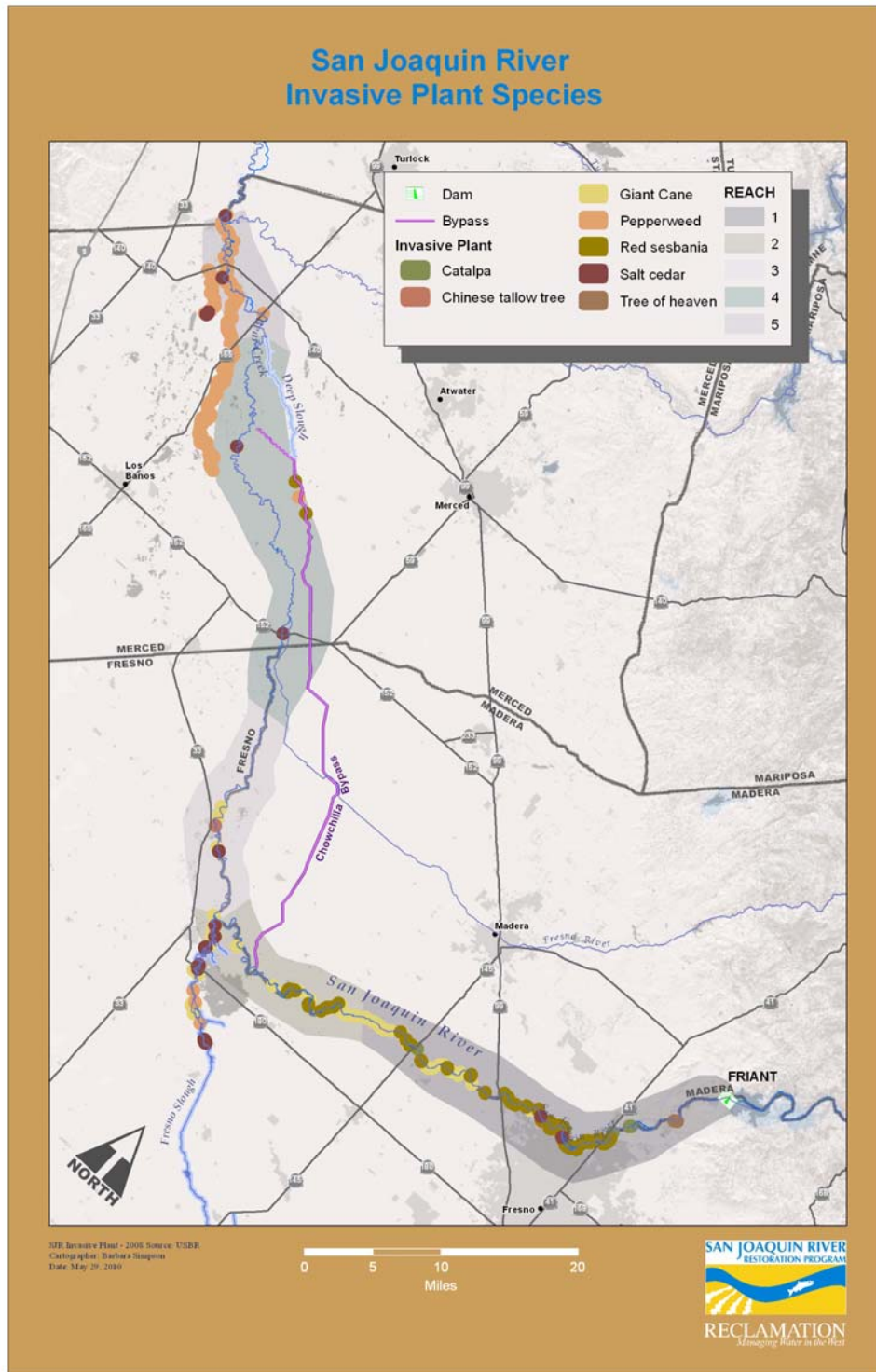
2.0 Description of Alternatives

The NEPA No-Action Alternative and the Proposed Action are described in this section. Under the No-Action Alternative, Reclamation would not conduct any invasive vegetation monitoring or management activities in the Restoration Area. This would not fulfill environmental commitments made in the *WY 2010 Interim Flows Project EA/IS* or Condition 24 of Order WR 2010-0029-DWR, which approved the temporary transfer and change for release of WY 2011 Interim Flows. The No-Action Alternative would increase the spread of invasive vegetation as a result of Interim Flows. The Proposed Action, the SJRRP Invasive Vegetation Monitoring and Management Project, would monitor invasive vegetation infestations and prioritize and implement management activities. These activities would control invasives in order to promote establishment of riparian habitat that supports the Restoration Goal. Additional details are provided in the following sections.

2.1 No-Action Alternative

The No-Action Alternative would not fulfill Reclamation's environmental commitments. The spread of invasive vegetation would increase as a result of Interim Flows. Figure 2-1 displays locations of seven main species of invasive vegetation (including five species to be managed under the Proposed Action) recorded during 2008 surveys by the Implementing Agencies. The monitoring was conducted by boat and at public river crossings. While focused surveys have not been conducted since 2008, observations indicate that invasive vegetation has continued to spread beyond 2008 levels during the first two years of Interim Flows.

Figure 2-1.
2008 San Joaquin River Invasive Vegetation Locations



2.2 Proposed Action

Areas containing invasive vegetation would either be mapped in the field directly or through aerial photograph interpretation followed by ground map verification surveys. Identification and removal would target giant reed (*Arundo donax*), sponge plant (*Limnobiium spongia*), Chinese tallow (*Sapium sebiferum*), red sesbania (*Sesbania punicea*), and salt cedar (*Tamarix sp.*). Priority sites with public or permitted access would receive invasive vegetation treatments using hand tools, herbicides, and mechanized above-ground debris removal. Minor revegetation and erosion control measures would enhance habitat and stabilize the river bank. Environmental protective measures would avoid impacts on sensitive resources. Spraying would be conducted during the active vegetation growing season (April 1- October 30), and other non-spraying activities would occur year-round through December 31, 2016. The Proposed Action is described in more detail in Table 2-1 and the following subsections.

Table 2-1. Invasive Vegetation Monitoring and Management Project Activities

Partner name	Location of Work	Work to be Performed	Equipment	Stream Crossings	Avoidance Measures
The Nature Conservancy	San Joaquin River, entire restoration reach	Landowner outreach, assembly of experts panel, coordination of meetings and review by experts panel, no on-the-ground weed management.	N/A	N/A	N/A
San Joaquin River Parkway & Conservation Trust	San Joaquin River Reach 1a and Reach 1B to Highway 145	<p>Invasives Removal:</p> <p>Giant reed (<i>Arundo donax</i>): Hand removal using loppers, weed wrenches, picks, shovels, chainsaws, bladed weed trimmers. Cut/paint and foliar spray application of glyphosate (Rodeo/Roundup/Aquamaster); possible use of imazapyr (Habitat). Dead <i>Arundo</i> stalks will be left in place unless it is located in the floodway; if located in floodway dead stalks will be hauled to higher ground and piled to decompose in place, will shred with bobcat-mounted masticator when requested by property owner or if the pile is deemed a fire hazard.</p> <p>Red Sesbania (<i>Sesbania punicea</i>), Tamarisk (<i>Tamarisk sp.</i>), Chinese Tallow (<i>Sapium sebiferum</i>): Hand removal using loppers, weed wrenches, picks, shovels, chainsaws, bladed weed trimmers. Cut/paint application of triclopyr (Garlon 4/Pathfinder II). Dead stems will be left in place. Cut biomass will be hauled out of floodway and piled to decompose in place. Biomass will be removed for disposal if required by property owner. Seeds dropped during removal process will be raked and bagged for offsite disposal. Seedlings <3' tall will be treated with foliar spray of glyphosate (Rodeo/Roundup/Aquamaster).</p> <p>Habitat enhancement: Minor revegetation using grasses and forbs when necessary and appropriate.</p> <p>Bank Stabilization: seeding, placement of erosion control blankets or similar when necessary and appropriate.</p>	<p>Pickup truck/passenger vehicle for monitoring and crew transportation – will use existing roads.</p> <p>Canoe or other boat will be used to transport biomass unreachable from the bank.</p> <p>Small tractor or bobcat with masticator will be used to shred piles of dead biomass, will use existing roads.</p> <p>Tractor/gator/pickup-mounted spray rigs for use in some areas</p>	Yes, by boat, will use existing boat launch facilities	Avoidance protocols for sensitive resources including state and federal listed species (VELB, BNLL, CTS, CRLF, Vernal pool crustaceans and rare plants) and nesting birds are described below. These measures will be reviewed and approved by FWS and CDFG prior to commencing work.

Partner name	Location of Work	Work to be Performed	Equipment	Stream Crossings	Avoidance Measures
River Partners	San Joaquin River Reach 1B past Highway 145 through Reach 5, including bypasses	<p>(Continued from previous page)</p> <p>Invasives Removal:</p> <p>Arundo donax: Hand removal using loppers, weed wrenches, picks, shovels, chainsaws, bladed weed trimmers. Cut/paint and foliar spray application of glyphosate (Rodeo/Roundup/Aquamaster); possible use of imazapyr (Habitat). Within an Environmentally Sensitive Area (ESA) designated due to being within 20 feet of active waterways:</p> <ul style="list-style-type: none"> • Garlon 4 would not be used, • Roundup would not be used except for paint and spot-spray hand applications (trigger release spray wands) and would not include an additional surfactant, • Rodeo would be used, but not with an additional surfactant. <p>Dead Arundo stalks will be left in place unless it is located in the floodway; if located in floodway dead stalks will be hauled to higher ground and piled to decompose in place, will shred with bobcat-mounted masticator when requested by property owner or if the pile is deemed a fire hazard.</p> <p>Trees including but not limited to Sesbania punicea, Tamarisk, Chinese Tallow: Hand removal using machetes, loppers, weed wrenches, picks, shovels, chainsaws, bladed weed trimmers. Cut/paint application of triclopyr (Garlon 4/Pathfinder II). Backpack sprayers and broadcast application of herbicides will be used where appropriate. Wicking by hand or by boom mounted wick applicator will be used in appropriate areas. Dead stems will be left in place. Cut biomass will be hauled out of floodway and piled to decompose in place. Biomass will</p>	<p>Pickup truck/passenger vehicle for monitoring and crew transportation – will use existing roads.</p> <p>Canoe or other boat will be used to transport biomass unreachable from the bank.</p> <p>Small tractor or bobcat with masticator will be used to shred piles of dead biomass, will use existing roads.</p> <p>Dump truck for hauling if needed.</p> <p>Chipper for processing dead plant material.</p> <p>Trailer for equipment transport.</p> <p>Tractor/gator/mule pickup-mounted spray rigs for appropriate areas.</p> <p>Sickle bar mower for removal of Arundo in some areas.</p>	<p>No equipment will enter river channel or banks. All river access will be by boat from appropriate launch sites.</p>	<p>Avoidance protocols for sensitive resources including state and federal listed species (VELB, BNLL, CTS, CRLF, Vernal pool crustaceans and rare plants) and nesting birds are described below. These measures will be reviewed and approved by FWS and CDFG prior to commencing work.</p>

Partner name	Location of Work	Work to be Performed	Equipment	Stream Crossings	Avoidance Measures
		<p>be removed for disposal if required by property owner. To (Continued from previous page)</p> <p>the best of our ability seeds dropped during removal process will be raked and bagged for offsite disposal. Seedlings <3' tall will be treated with foliar application of glyphosate (Rodeo/Roundup/Aquamaster).</p> <p>Perennial and annual noxious weeds including but not limited to: perennial pepperweed, yellow star thistle, poison hemlock: Foliar application of glyphosate (Rodeo/Roundup/Aquamaster). Wicking applications by hand or mounted rig where appropriate. Dead stems will be left in place to decompose.</p> <p>Use of Aminopyralid (Milestone) for treating invasive thistles and woody plants.</p> <p>Surfactants would be limited to Agri-Dex, Hasten Modified Vegetable Oil, Freeway, Dyne-Amic, Kinetic, and Pro-Spreader Activator, as described in Table 2-3.</p> <p>Habitat enhancement: Minor revegetation using grasses and forbs when necessary and appropriate.</p> <p>Bank Stabilization: seeding, placement of erosion control blankets or similar when necessary and appropriate.</p>			

2.2.1 Invasive Plant Removal

Monitoring and management activities will focus primarily on giant reed (*Arundo donax*), Chinese tallow (*Sapium sebiferum*), red sesbania (*Sesbania punicea*), salt cedar (*Tamarix* species), and sponge plant (*Limnobiium spongia*). In addition, other known invasive plants species, such as perennial pepperweed (*Lepidium latifolium*), tree of heaven (*Ailanthus altissima*), scotch broom (*Cytisus scoparius*), fig (*Ficus carica*) and other weeds species that have been identified as problematic on the San Joaquin River in previous weed management work will be monitored and treated opportunistically and as access and conditions allow.

Methods

- In most cases, invasive plant removal will be done by hand removal methods. Hand removal methods include hand pulling and use of hand tools such as weed wrenches, string trimmers, loppers, chainsaws, hand picks, and shovels.
- In some cases, powered equipment would be used to remove invasive plants. The majority of these cases are when there are large stands to be removed. The equipment proposed to be used includes flail mowers, sickle-bar mowers, masticators, and chippers, which would be used to cut or reduce invasive plant stands and chip material for removal or mulch. Mounted equipment (e.g., backhoe or excavator) for the flail mower and vehicles that pull the chipper would be restricted to existing roads and access paths. Compact tractors (Bobcat-like) with rubber tracks or tires and a front mounted masticator would use existing roads and access paths to access giant reed stands. Equipment is restricted to existing roads to avoid crushing animal burrows. Permission to operate equipment beyond existing roads would be requested from the Service on a site-specific basis.
- Vegetation removal would occur above ground only and would not result in soil disturbance.
- Limited chemical treatment by hand application would include herbicides in both aquatic formulations and their respective active ingredient: Rodeo, AquaMaster, and Roundup (glyphosate) Habitat (imazapyr), and Garlon 4 and Pathfinder II (triclopyr BEE), Telar (chlorsulfuron), and Milestone (aminopyralid). Roundup, Garlon 4, Pathfinder II, Telar, and Milestone will only be used in areas outside the riparian zone, defined as a 20-foot buffer (at minimum) away from the ordinary high water mark of the San Joaquin River. Only Rodeo, Aquamaster, and Habitat would be used in the riparian zone. No herbicides would be used in active waterways. The herbicides would be used in accordance with label directions and only by licensed applicators approved by the California Department of Pesticide Regulations (DPR). Tables 2-2 and 2-3 summarize herbicides and surfactants proposed for use during the Project.

Table 2-2 Summary of herbicides and use within the proposed action area

Herbicide	Target Veg Species	Riparian Zone (RZ) and/ or Terrestrial Floodplain (TF)	Application Method	Surfactants or other adjuvants	Mixture concentrations
Rodeo (glyphosate)	Arundo Pepper weed	RZ	Cut Stump paint, Sprayer, Wick	Nonionic surfactant at 0.5-1% v/v concentration	2% solution
Roundup (glyphosate)	Arundo	TF	Cut Stump paint, Sprayer, Wick	Nonionic surfactant at 0.5-1% v/v concentration	2% solution
Aquamaster (glyphosate)	Arundo Pepper weed	RZ	Cut Stump paint, Sprayer, Wick	Nonionic surfactant at 0.5-1% v/v concentration	2% solution
Habitat (isopropylamine salt of imazapyr)	Woody Species and Arundo	RZ	Cut Stump paint, Sprayer, Wick	Vegetable oil concentrate at 1.5-2 pints /acre	2-6 pints/acre depending on species treated
Garlon 4 (Triclopyr BEE)	Woody Species	TF	Cut Stump paint, Sprayer, Wick	Crop Oil concentrate at .5-2% v/v concentration	1-8 quarts/acre depending on species treated
Pathfinder II (triclopyr BEE)	Woody Species	TF	Cut Stump paint, Sprayer, Wick	No surfactant recommended on label	Not to exceed 8 gallons/acre/year
Milestone (aminopyralid)	Thistles and some woody species	TF	Sprayer	Non-ionic surfactant at .25-0.5% v/v concentration	3-7 oz/acre depending on species treated
Telar (chlorsulfuron)	Pepper weed	TF	Sprayer	Nonionic surfactant at 0.5-1% v/v concentration	3oz/acre

Table 2-3 Surfactants proposed for use with the herbicides listed in Table 2-2

Surfactant	Nonionic or Oil Concentrate	Use in the riparian zone (RZ) and/or terrestrial floodplain (TF)
Freeway	Non-ionic	RZ, TF
Pro-Spreader Activator	Non-ionic	TF
Kinetic	Non-ionic	RZ, TF
Agri-Dex	Oil Concentrate	RZ, TF
Dyne-Amic	Oil Concentrate	RZ, TF
Hasten Vegetable Oil	Oil Concentrate	RZ, TF

- Herbicide application methods would include cut and paint stumps, foliar spray or spot spray, cut and paint of regrowth, prep-and-spray, and stem injection. All applications would be done using hand bottles, backpack sprayers, or all-terrain vehicle (ATV)-mounted power sprayer with low-drift methods (e.g., a coarse drip nozzle). A registered, non-toxic dye to improve detection of overspray would be added to the mixture for all sprayer tank types.
- Standard safety practices for herbicide storage, mixing, transportation, disposal of containers and unused herbicide, and spill management would be followed. Mixing of chemicals and cleaning of equipment should be done well away from waterways in situations from which runoff would not directly enter waterways. Herbicide mixtures would be stored in leak-proof containers.
- Spraying would be conducted between April 1- October 30 when the plant is most susceptible to the herbicide used (usually when it is at its most vigorous growth stage). Other activities, such as physical plant removal, may continue during other times of year.
- Herbicides would be sprayed as stated on the labels when wind speeds are between 3-10 MPH to avoid both inversion during calm conditions and drift during windy conditions. Herbicides would also not be applied in the rain or within 72 hours of predicted rainfall.
- Reclamation would use the *Center for Biological Diversity vs. EPA* (Case C-02-1580-JSW) as guidance for implementing activities including use of glyphosate, imazapyr, and triclopyr.
- To avoid degradation to water quality, herbicide treatment within 20 feet of an active waterway (stream with flowing or standing water) would be done using herbicide formulations approved for use in aquatic/riparian settings. Every effort would be taken to conduct direct spray methods away from waterways. All herbicide mixtures would include a colored dye and only NMFS-approved surfactants.
- Prior to implementation of the invasive plant removal, the extent of native vs. nonnative plants and their habitat suitability for wildlife would be carefully evaluated by biologists. The scope and timing of the removal efforts would be determined based on these criteria so that sites with existing high quality wildlife habitat would have minimal temporary loss of habitat quality during removal of

the invasive plants. An example for such areas would be to phase removal work over time, where feasible and cost-impactive, to not remove all invasive plants in a large infestation area at once, and incorporating restoration of the appropriate desired native replacement plantings.

- Following herbicide applications, dead biomass would be left on site to decompose standing upright, bent over, or cut and laid in piles. If necessary, biomass may be removed by hauling away the cut vegetation, chipping them in place (if stands are close to existing access roads), or by mulching the standing vegetation with masticators and/or flail mowers. Solarization techniques may be employed to destroy viable seeds by temporarily covering debris piles with clear plastic. Cut stems can also be piled and burned, under appropriate permits, in place during the winter months or mulched in place during other seasons for use by new native plantings. If the plants are cut before herbicide application takes place, the cut vegetation or resulting regrowth must be treated with follow up applications of herbicide.
- Material that is mulched on-site would be done so using a chipper, an excavator mounted flail mower, or a masticator mounted to the front of a compact tractor with rubber tracks or tires. A flail mower using existing roads could be extended by boom arm to the invasive plant stand.
- In-stream work involving hand methods would be performed during summer and fall low-flow or dry periods.
- When crossing using a boat, the operator would launch the boat from an existing access point or a location identified during the project area survey. No herbicides would be transported across the San Joaquin River via a boat or floatable device.

Invasive plant removal would take place on public lands and on private property in cooperation with willing landowners. Infested areas would either be mapped in the field directly or through aerial photograph interpretation followed by on-the-ground map verification surveys. Sites would be monitored post-treatment according to a protocol to be established by the Trust, and the Trust would complete secondary treatment of invasive species while following all avoidance measures in this EA.

2.2.2 Timing

Invasive weed treatment will be timed for maximum efficacy based on phenology of plants to be treated and implemented to avoid adverse impacts on sensitive resources. If activities must be conducted during periods that may result in impacts on sensitive resources, specific protocols will be implemented to avoid impacts to these resources.

2.2.3 Planting

After weed removal, in some instances, native grasses and other native riparian herbaceous species (including creeping wildrye (*Leymus triticoides*), mugwort (*Artemisia douglasiana*), gumplant (*Grindelia camporum var camproum*), evening primrose (*Oenothera elata*) and others) will be cultivated to prevent soil erosion and the reemergence of invasive plants. Methods will include broadcast seeding, drill seeding and/or planting plugs. Where feasible and practical, irrigation may be used to support the

establishment of native plants. It is anticipated that the majority of planting work to include un-irrigated plug plantings in areas that will not be sprayed during routine levee district maintenance activities. The species listed are known to be tolerant of flooding and receding water levels, as well as aggressive against invasive weeds, spreading readily from rhizomes, or producing prolific seed that will enhance downstream conditions considerably. Additionally, native herbaceous species proposed for planting will enhance the food base for pollinators, providing benefits to agriculture in the area. The spread of these species to adjacent properties is not likely to cause undue vegetation management pressure on adjacent farms as farmers in this region have sophisticated weed control regimes which would preclude establishment of native herbs almost exclusively. The proposed native herbs are not known to exclusively harbor threatened or endangered species.

2.2.4 Environmental Commitments

Environmental commitments are measures or practices adopted by a project proponent to reduce or avoid adverse impacts that could result from project operations. The following sections describe the environmental commitments that would be conducted in coordination with Interim and Restoration Flows implementation to avoid any potentially adverse environmental consequences.

For the purpose of avoiding potential impacts on sensitive resources resulting from the project, any project activities undertaken within the riparian corridor or in the immediate vicinity will employ general avoidance protocols, including:

- An on-site biological monitor who is familiar with the San Joaquin River would survey the area for special-status species. Any potential habitat for special-status species would be flagged and identified as an ESA. These areas would be avoided and spraying not permitted within the appropriate buffer area. For areas adjacent to an active waterway, biologists would identify and flag a 20-foot buffer where herbicide spraying would be restricted according to the measures described in this EA.
- An on-site biological monitor(s) shall be present during all Project activities in areas flagged and identified as an ESA.
- An on-site biological monitor(s) shall educate crews about the importance of the waterways and riparian habitat before work begins. The biological monitor conducting the education session would provide the session in English and Spanish, and would distribute a sign-in sheet to record attendance of each session.
- Project-related vehicles shall observe a speed limit of 20-mph throughout the site in all project areas, except on county roads and State and Federal highways where posted speed limits will be obeyed. If roads are encountered where 20-mph is excessive, a lower, prudent speed would be maintained.
- All food-related trash items such as wrappers, cans, bottles, and food scraps would be packed-in, packed-out on a daily basis.
- No dogs, cats, or other domesticated animals/pets would be allowed on the project

site.

- No firearms shall be allowed on the project site.
- All herbicide treatments would be conducted by a licensed applicator. Herbicides would be applied to foliage and stem, or injected into stems of invasive plants. Herbicides would not be sprayed directly into streams, pools, ponds, or wetlands.
- Where mechanized cutting, mulching, chipping or excavation of living or dead invasive plants and removal of invasive plant biomass will take place near native revegetation, these resources will be avoided to the greatest degree possible.
- No equipment will be stored, staged or fueled within the stream channel or a 50 foot buffer zone of the banks of streams, wetlands, or other sensitive areas.

Known sensitive resources occurring within the geographic scope of the project include a wide variety of sensitive plant and animal species. Sensitive resources that could be present in the project areas are discussed below, along with protocols developed to avoid impacts to these resources while providing maximum project benefits to native plant and wildlife species.

Biological

Several special-status species and sensitive habitats are known to or have the potential to occur in the Restoration Area based on analysis included in the WY 2010 Interim Flows EA/IS. Because invasive plant removal will take place near or within potential habitat of protected species, avoidance measures are included in the project to prevent short term direct or indirect adverse impacts on the species, if present. Importantly, the overall project is aimed at improving habitat quality for native plant, fish and wildlife species as well as restoring the integrity of sensitive native riparian communities.

State and Federal special-status species will be evaluated for potential presence. These include threatened, endangered, candidate, and proposed species, federal species of concern, California species of special concern, California fully protected species, and plant species ranked by CNPS as list 1B (rare, threatened, or endangered in California and elsewhere) or list 2 (rare, threatened, or endangered in California, but common elsewhere). However, the following sections only discuss the federal- and state-listed wildlife and plant species that need to be avoided by project activities.

Most of the invasive plant removal methods will involve hand crews using weed wrenches, chain saws, and loppers. Disturbance to the overall riparian habitat will be minimal. In cases where flail mowers and masticators will be used, this equipment will be restricted to use adjacent to existing roads, levees, or access paths where there is clear access to invasive plant stands. If stands are located where native vegetation separates the stands from existing roads, levees, or access paths, this equipment will not be used and hand methods will be implemented instead.

Removal of invasive species will be done by hand and using hand tools such as weed wrenches, loppers, weedeaters, and chainsaws. No heavy equipment will be used and no large ground disturbance is planned for the project. The herbicides used are not expected

to result in population decreases in wildlife and fish species. The herbicides used near water will be aquatic-approved formulations of glyphosate and imazapyr. Special-status plant species typically do not co-occur with dense stands of arundo or other invasive plants. In areas with less dense stands arundo or other invasive plants, where native habitat is present around the stands, special-status plant species will be identified by a qualified botanist in the field prior to administration of herbicides. Should any of these species be present near treatment sites, they will be flagged for avoidance and spray methods shall be evaluated to select the most localized methods.

Wildlife

The following sections discuss the federal- and state-listed wildlife species. In each section, a brief description of each species or group of related species is provided. These descriptions are followed by avoidance and minimization measures that will be implemented as part of the project to ensure that the project avoids potential adverse impacts to special-status wildlife species.

Aquatic and Terrestrial Invertebrates

Valley Elderberry Longhorn Beetle

Blue elderberry shrubs (*Sambucus nigra ssp caerulea*) that provide habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus* [VELB]), a species federally listed as threatened, are abundant throughout the project area. Many locations within the project area have been surveyed for elderberry shrubs, and these previous surveys may already include numerous areas planned for treatment as part of this project. In those locations where previous elderberry shrub inventories have not yet been conducted, elderberry shrubs will be inventoried at each specific treatment site where weed removal and treatment activities will take place. In areas planned for treatment that contain elderberry shrubs the project will avoid impacts to VELB by implementing the following measures:

VELB-1:

- A 100-foot buffer shall be established around the dripline of each eligible elderberry shrub (stems >1" diameter) located near treatment sites. The elderberry shrubs and buffers shall be clearly flagged and marked as an ESA. The Service-approved biological monitor would establish at least one permanent photo point for each shrub or group of shrubs while conducting the pre-treatment survey.
- A 20-ft buffer around the dripline would be fenced off and no activities would occur within the buffer without Service approval.
- No equipment (i.e., flail mowers, masticators, and chippers) shall be used within the 20-foot buffer from the dripline of elderberry shrubs.
- On-site biological monitor(s) shall be present during all Project activities in areas flagged and identified as an ESA.

- Focused herbicide application methods would be applied to invasive plants within the 100-foot buffer from the dripline of elderberry shrubs (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 100 feet of elderberry shrubs is not expected to result in adverse impacts to VELB as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR.
- A biological monitor would return to ESAs within 2-6 weeks of treatment to survey for any impacts to elderberry shrubs related to the spraying. The monitor would return to the established photo points and collect a second set of photos. If impacts of spraying are observed, the Trust would suspend spraying within the 100-foot buffer until the spraying rules within the buffer are revised with agreement from the Service.

Mammals

Fresno Kangaroo Rat

Fresno Kangaroo Rat (*Dipodomys nitratoides exilis*; FKR), a state and federally endangered species, historically inhabited alkali sink, chenopod scrub and annual grassland communities on the San Joaquin Valley floor from Kings to Merced Counties. In the project area, designated critical habitat for FKR is within the Alkali Sink Ecological Reserve near Mendota Wildlife Area. They have historically been found in project reaches: 1B, 2A, 2B, and 3. To avoid impacts to FKR, the following measures will be incorporated into the project:

FKR-1:

- For areas that are considered FKR habitat, burrow surveys would be performed and any potentially occupied burrows would be clearly flagged with a 100' avoidance buffer and marked as an ESA.
- No equipment (i.e., flail mowers, masticators, and chippers) shall be used within the 100-foot buffer from potentially occupied burrows.
- Biological monitor(s) shall be present during all Project activities in areas flagged and identified as an ESA.
- Where treatment sites are identified within the 100-foot buffer from potentially occupied burrows, prioritized focused herbicide application methods would be applied to invasive plants within the 100-foot buffer (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 100 feet of potentially occupied burrows are not expected to result in adverse impacts to FKR as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR.
- If a FKR or evidence of FKR activity is found, all activity will stop and the Service will be notified. Due to intensive agricultural practices around the San Joaquin River, the likelihood of FKR presence is highly unlikely.

San Joaquin kit fox

San Joaquin kit fox (*Vulpes macrotis mutica*; SJKF), a federally endangered species, requires dens for shelter, protection and reproduction. Loose-textured soils are preferable for denning, but modification of the burrows of other animals facilitates denning in other soil types. SJKF is present throughout the San Joaquin Valley largely using annual grassland and various scrub and subshrub communities. Vernal pool, alkali meadows and playas also support habitat, but have wet soils unsuitable for denning. Some suitable habitat has been converted to agricultural uses. SJKF can use small remnants of native habitat interspersed with development provided there is minimal disturbance, dispersal corridors, and sufficient prey-base. No ground disturbing activities are proposed, however vegetation removal may have a disturbing impact on SJKF dens. The temporary reduction in vegetative cover due to invasive species treatment is not expected to have an adverse impact on prey base as target invasive species within kit fox habitat areas (arundo, salt cedar, and other tree species) are not known to provide enhanced cover for rodents and other prey species. This species historical range occurs along all reaches of the project. To avoid impacts to SJKF, the following measures will be incorporated into the project:

SJKF-1:

- Preconstruction surveys would be conducted within 48 hours prior to any treatment activities and implementation of avoidance and minimization measures prior to and during construction activities for SJKF per the 2011 *U.S. Fish and Wildlife Service Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011). This includes identifying any potential kit fox dens.
- To avoid impacts to potential kit fox dens, a protective exclusion zone would be clearly flagged according to the established protocols and labeled as an ESA.
- No equipment (i.e., flail mowers, masticators, and chippers) shall be used within the ESA.
- Where treatment sites are identified within the established buffer area around potential dens, prioritized focused herbicide application methods would be applied to invasive plants within the 50-foot (or 100-foot in the case of known dens) buffer (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 50 feet of potential dens are not expected to result in adverse impacts to SJKF as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR.
- Where FKR and SJKF may be found in the same location, then the exclusion zone or buffer area of greater distance will be adhered to.

SJKF-2:

- If occupied dens are present within the work area, the project team will notify CDFG and the Service immediately and cease all work within the project site until a Service-approved biological monitor determines the den is no longer occupied.

Amphibians and Reptiles

Giant Garter Snake

Giant garter snake (*Thamnophis gigas*; GGS), a federally threatened species, inhabits a variety of aquatic habitats, such as agricultural wetlands, irrigation and drainage canals, marshes, sloughs, ponds, lakes, and streams. They are primarily restricted to aquatic habitat and nearby basking areas during their active period (April 1–October 1). GGS retreat to small mammal burrows and other soil crevices above prevailing flood elevations during the winter dormancy period (November to mid-March), when they are particularly sensitive because of limited opportunities for escape from disturbance (USFWS 1998). This species occurs in all reaches of the project.

To avoid impacts to GGS, the following measures will be incorporated into the project:

GGGS-1:

- For areas that are considered GGS habitat, project activities would be conducted between May 1 and October 1, the active period for the snake.
- However, for giant reed removal, because of the biology and phenology of giant reed, the most impactful time to remove and treat this species is in the late summer/fall (August through November). Therefore, project activities occurring in between October 2 through November would implement the following measures:

GGGS-2:

- To avoid impacts to GGS during their inactive season, a protective exclusion zone would be clearly flagged, staked, or fenced and designated as an ESA. Any Project activities within this area would have Biological monitor(s) present.
- Clearing would be confined to the minimal area necessary to facilitate Project activities. Project activities shall be minimized within 200 feet of the banks of GGS habitat. Movement of heavy equipment would be confined to existing roadways to minimize habitat disturbance.
- Clearing of invasive plant material within 200 feet of potential GGS habitat would be done using hand tools so as not to result in adverse ground disturbance.
- Where treatment sites are identified within the 200-foot buffer from potential giant garter snake aquatic habitat, prioritized focused herbicide application methods will be applied to invasive plants within the 200-foot buff (wicking,

spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 200 feet of potential GGS habitat is not expected to result in adverse effects to GGS as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR. Herbicides would not be applied within a 200-foot buffer surrounding potential GGS habitat identified as an ESA.

California Tiger Salamander

California tiger salamander (*Ambystoma californiense*; CTS), a federally threatened species in the Central Valley, uses both aquatic and upland habitats. Aquatic habitats used by CTS include pools that contain standing water continuously for at least 10 weeks, extending into April. Upland habitats within 1.24 miles of breeding ponds may be used for transit and aestivation. CTS over-summer in burrows excavated by other animals (gophers and ground squirrels) and actively migrate to ponds for breeding at night between November and February. The timing of our activities, which will be conducted during daylight hours with most work being conducted during the growing season, will not conflict with the timing of CTS migration. While no ground disturbing activities are proposed, vegetation treatment and removal around aestivation burrows may impact CTS.

Proposed critical habitat for CTS (Units 12 and 13) occurs near the project area, and may include specific treatment sites at the Merced NWR. This species may occur in all reaches of the project. To avoid impacts to CTS, the following measures will be incorporated into the project:

CTS-1:

- Within suitable CTS habitat areas, prior to any treatment activities, Project sites would be surveyed for potential aestivation burrows and any potential burrows would be clearly flagged with a 250' avoidance buffer and marked as an ESA.
- Any Project activities occurring within the ESA would implement the following measures:

CTS-2:

- No equipment (i.e., flail mowers, masticators, and chippers) shall be used within the 250-foot buffer from potential burrows.
- Where treatment sites are identified within the 250-foot buffer from potential burrows, prioritized focused herbicide application methods would be applied to invasive plants within the 250-foot buffer (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 250 feet of potential burrows are not expected to result in adverse impacts to CTS as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR.

Blunt-nosed leopard lizard

Blunt-nosed leopard lizard (*Gambelia sila*; BNLL), a federally endangered species, inhabits non-native grassland and alkali sink scrub communities of the San Joaquin Valley floor marked by poorly drained, alkaline, and saline soils (it is suggested that perhaps they are associated with these soils only because they are the last remaining undeveloped soil types within the historic range). BNLL use small mammal burrows (typically abandoned ground squirrel tunnels and occupied and abandoned kangaroo rat tunnels) for shelter and dormancy. They also construct shallow tunnels under exposed rocks or earth berms where small mammal burrows are scarce. BNLL are only active from March to July, mostly in temperatures ranging from 25-35° C. Suitable habitat has been identified within Reach 2, the Eastside bypass, and Reach 4B of the San Joaquin River. No ground disturbing activities are proposed, however vegetation removal near burrows may disrupt BNLL. Flooding in the spring of 2011 has most likely drowned aestivating BNLL within the project reaches, leaving a minimal chance that disturbance of this species will occur. However, to avoid impacts to BNLL, the following measures will be incorporated into the project:

BNLL-1:

- For areas that are considered BNLL habitat, burrow surveys would be performed and any potential burrow would be clearly flagged with a 50' avoidance buffer and marked as an ESA.
- No equipment (i.e., flail mowers, masticators, and chippers) shall be used within the 50-foot buffer from potential burrows.
- Where treatment sites are identified within the 50-foot buffer from potential burrows, prioritized focused herbicide application methods would be applied to invasive plants within the 50-foot buffer (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 50 feet of potentially occupied burrows are not expected to result in adverse impacts to BNLL as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR.

Fish

A total of two listed fish species or evolutionarily significant units (ESUs) of a species are known or have potential to occur in the project area. These species or ESUs are the Central Valley California steelhead ESU (*Oncorhynchus mykiss irideus*), and spring-run chinook salmon (*Oncorhynchus tshawytscha*). An ESU is a distinctive group of anadromous fish (i.e., Pacific salmon, steelhead, or sea-run cutthroat trout) generally segmented by the geographic region within which the group spawns or the time of year during which the group spawns. Many of these species, because of their migratory nature, spend only a portion of their lives in the project area. In general, because project activities will take place outside the stream channel and will be timed to avoid seasonal migrations of anadromous fish, no direct impacts to these species are expected to occur as a result of project implementation. In cases where treatment sites are located in in-stream

islands or gravel bars and access to those islands require crossing flowing streams, the following measures will be implemented:

FISH-1:

- Stream crossing by boat would avoid disturbing the stream bank. No herbicides would be transported across active waterways.
- These crossing locations would be identified and mapped.
- Crossing would occur during the summer and fall low-flow periods.
- When crossing using a boat, the operator would launch the boat from an existing access point or a location identified during the project area survey.

Indirect impacts, as a result of project implementation, would also be avoided through implementation of the following measures:

FISH-2:

- All staging, parking, and materials laydown areas and all areas where hazardous materials (i.e., fuel, large quantities of herbicides, etc.) would be stored would be located at least 50 feet outside of the streambanks. Mixing of chemicals and cleaning of equipment should be done well away from waterways in situations from which runoff would not directly enter waterways. Herbicide mixtures would be stored in leak-proof containers.
- No activity that would impede the normal flow of water in any creek, stream, or river would be implemented as part of this project; and,
- No activity that would disrupt the movement of resident and anadromous fish species in the stream would be implemented as part of this project.

Birds

Swainson's hawk, White-tailed kite, and other nesting raptors

The riparian corridor throughout the project area provides suitable nesting habitat for a variety of raptor species which are protected under state and federal law. These species include the state-listed threatened Swainson's hawk (*Buteo swainsoni*) and the CDFG fully-protected white-tailed kite (*Elanus leucurus*). Project activities are not expected to result in the loss of nesting habitat. No native, large-canopy trees will be removed as part of this project, only invasive species such as giant reed and salt cedar. The removal of the invasive plants and associated treatment with herbicides is not expected to result in the death or injury of raptors. However, the project has the potential to disturb nesting/breeding raptors, resulting in nest abandonment and/or forced fledging of young. Impacts to nesting raptors will be avoided through the use of the following measures:

RAPTOR-1:

- Project partner personnel such as project coordinators, restoration ecologists, or crew supervisors will be trained by a qualified biologist on general breeding raptor behavior and evidence of nesting.
- Before working in a specific treatment site, crews will scan trees and shrubs to assess whether potential raptor nests are present.
- If potential raptor nests or breeding raptors are observed, A qualified biologist will be required to survey the area to identify the species and determine nest location. General CDFG guidelines recommend implementation of 500 foot buffers around raptor nests, but the size of the buffer may be adjusted depending on species and if a qualified biologist and CDFG determine it would not be likely to adversely affect the nest. Monitoring of the nest by a qualified biologist may be required if the activity has potential to adversely affect the nest.

Least Bell's Vireo, Willow Flycatcher, and Yellow-Billed Cuckoo

The least Bell's vireo (*Vireo bellii*; LBV) is a migratory songbird dependent on riparian habitat for breeding. This species typically inhabits structurally diverse woodlands along watercourses, including cottonwood-willow forests, oak woodlands, and mule fat scrub. The features or elements of habitat that are essential to the conservation of the LBV can be described as riparian woodland vegetation that generally contains both canopy and shrub layers and includes some associated upland habitats. General activities that could cause destruction or adverse modification of LBV habitat include the following: (1) removal or destruction of riparian vegetation; (2) thinning of riparian growth, especially near ground level; (3) removal or destruction of adjacent upland habitats used for foraging; and (4) increases in human-associated or human-induced disturbances (USFWS, 1998).

The willow flycatcher (*Empidonax traillii*; WF) is a small passerine that breeds in riparian and mesic upland thickets in the United States and southern Canada (AOU 1983). WF breed in shrubby riparian vegetation and typically have at least some surface water or saturated soil within the defended territory during the early portion of the breeding season (Bombay et al, 2003).

Yellow-billed Cuckoos (*Coccyzus americanus*; YBC) historically bred throughout riparian systems of western North America from southern British Columbia to Mexico, as well as in most of the eastern United States (Hughes 1999). In western North America cuckoos inhabited the deciduous riparian woodlands once lining most rivers and streams. YBC breed in large blocks of riparian habitat, particularly riparian woodlands with cottonwoods and willows (USFWS 2001). In California, nesting occurs between late June and late July, but may begin as early as late May, and continue into late August.

Impacts to nesting YBC, LBV, and WF would be avoided by use of the following measures:

BIRD-1:

- At sites where invasive vegetation management is scheduled April 10- August 31, Service-approved biologists would make initial visits to determine if suitable habitat may be present for listed bird species.
- Where suitable habitat may be present, one recon-level survey per site would be conducted by biologists adhering to guidelines documented by Haltermann et al, May 2009 for YBC; LBV Survey Guidelines, USFWS, January 19, 2001; and Bombay et al, May 29, 2003 for WF.
- If LBV and/or YBC are detected or suspected to be present, information would be collected according to the applicable guidelines and the Service/CDFG would be contacted to determine next steps.

2.3 Relationship to Related Projects

WY 2010 Interim Flows Project

The Project meets the vegetation monitoring and management commitments in the WY 2010 Interim Flows Project EA.

WY 2011 Interim Flows Project

The Project meets the vegetation monitoring and management commitments in the WY 2011 Interim Flows Project EA.

WY 2012 Interim Flows Project

The Project would be implemented in coordination with the WY 2012 Interim Flows Project as described in the SEA.

This page left blank intentionally.

3.0 Affected Environment and Environmental Consequences

This section provides an overview of the physical environment and existing conditions that could be affected by the Proposed Action consistent with NEPA guidelines. Each resource discussion in this section will evaluate the impacts of the proposed action's alternatives. The baseline conditions assumed in this document consist of the existing physical environmental conditions as of January 2012. Therefore, the baseline environment includes the existing releases of Interim Flows on the San Joaquin River between Friant Dam and the confluence of the Merced River.

CEQ regulations for implementing NEPA specify that environmental documents must succinctly describe the environment in the area(s) to be affected or created by the alternatives under consideration. The descriptions shall be no longer than necessary to understand the impacts of the alternatives. Data and analysis must be commensurate with the importance of an impact, with less important material summarized, consolidated, or simply referenced.

3.1 Biological Resources

3.1.1 Affected Environment

By the mid-1940s, most of the valley's native habitat had been altered by man, and as a result, was severely degraded or destroyed. It has been estimated that more than 85 percent of the valley's wetlands had been lost by 1939 (Dahl and Johnson 1991). When the CVP began operations, over 30 percent of all natural habitats in the Central Valley and surrounding foothills had been converted to urban and agricultural land use (Reclamation 1999). Prior to widespread agriculture, land within the Proposed Action area provided habitat for a variety of plants and animals. With the advent of irrigated agriculture and urban development over the last 100 years, many species have become threatened and endangered because of habitat loss. Of the approximately 5.6 million acres of valley grasslands and San Joaquin saltbrush scrub, the primary natural habitats across the valley, less than 10 percent remains today. Much of the remaining habitat consists of isolated fragments supporting small, highly vulnerable populations (Reclamation 1999). The Proposed Action area includes areas of diminished riparian forest due to decades of flow restriction, as well as invasive vegetation species which alter habitat available to species.

Reclamation requested an official species list from the Service through the Sacramento Field Office's website and used the list for development of a Biological Assessment for the Proposed Action. The list is for Fresno, Madera, and Merced Counties in United States Geological Survey 7 ½ minute quadrangles. Species and critical habitat potentially in the Proposed Action area are included in Table 3-1.

**Table 3-1.
Listed Species and Critical Habitat Potentially Present in the Proposed Action Area**

Species Common Name	Scientific Name	Listing Status	Designated Critical Habitat?
Swainson's hawk	<i>Buteo swainsoni</i>	T (State)	No
white-tailed kite	<i>Elanus leucurus</i>	E (State)	No
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	E (State)	No
least Bell's vireo	<i>Vireo bellii pusillus, vireo</i>	E	No
Willow flycatcher	<i>Empidonax traillii</i>	E	No
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	E	No
California tiger salamander	<i>Ambystoma californiense</i>	T	Yes
Fresno kangaroo rat	<i>Dipodomys nitratooides exilis</i>	E	Yes
Giant garter snake	<i>Thamnophis gigas</i>	T	No
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	T	No
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E	No
Central Valley California steelhead distinct population segment (DPS)	<i>Oncorhynchus mykiss irideus</i>	T	Yes
Central Valley spring-run Chinook salmon evolutionarily significant unit (ESU)	<i>Oncorhynchus tshawytscha</i>	T	Yes

3.1.2 Environmental Consequences

No Action

Under the No Action Alternative, invasive vegetation would not be monitored or managed on the San Joaquin River. It is reasonable to assume that invasive vegetation would continue to reproduce and spread within the Proposed Action Area and perhaps at an accelerated rate aided by Interim Flows releases from Friant Dam. In some areas, dense stands of invasive vegetation could have detrimental impacts to species and their habitats.

Proposed Action

The Proposed Action includes plans to conduct invasive vegetation monitoring and management on the San Joaquin River between Friant Dam and the Merced River confluence. The Proposed Action would limit spread and reduce existing presence of invasive vegetation. Enhancement of riparian habitat resulting from the Proposed Action would potentially have beneficial impacts for aquatic and terrestrial species. Therefore, the Proposed Action will not adversely impact biological resources.

3.2 Water Quality & Hydrology

3.2.1 Affected Environment

Water quality in various segments of the San Joaquin River below Friant Dam is degraded because of low flow, and discharges from agricultural areas, wildlife refuges, and wastewater treatment plants. The following subsections describe surface water quality conditions within San Joaquin River reaches in the Restoration Area. The *Water*

Quality Control Plan for the Sacramento and San Joaquin river basins (Basin Plan), adopted by the Central Valley RWQCB in 1998, is the regulatory reference for meeting Federal and State water quality requirements, and lists existing and potential beneficial uses of the San Joaquin River. The current Basin Plan review is anticipated to provide regulatory guidance for TMDL standards at locations along the San Joaquin River.

Water quality in Reach 1 is influenced by releases from Friant Dam, with minor contributions from agricultural and urban return flows. Water quality data collected at San Joaquin River below Friant demonstrate the generally high quality of water released at Friant Dam from Millerton Lake to Reach 1. Temperatures of San Joaquin River water releases to Reach 1 depend on the cold-water volume available at Millerton Lake (Reclamation 2007).

During the irrigation season, water released at Mendota Dam to Reach 3 generally has higher concentrations of total dissolved solids (TDS) than water in the upper reaches of the San Joaquin River. Increased EC and TDS concentrations demonstrate the impact of Delta contributions to San Joaquin River flow. Water temperatures below Mendota Dam depend on water temperatures of inflow from the DMC and, occasionally, the Kings River system via James Bypass (Reclamation 2007).

Water quality criteria applicable to some beneficial uses are not currently met within Reaches 3 and 4. Proposed Clean Water Act Section 303(d) listings for these reaches include boron, EC, and some pesticides. TMDL and Basin Plan amendments are currently in place for diazinon and chlorpyrifos runoff into the San Joaquin River. TMDLs and Basin Plan amendments are currently being developed for selenium, salt and boron, and pesticides. Water temperature conditions in Reach 4A depend on inflow water temperatures during flood flows from Reach 3 (Reclamation 2007).

Reach 5 typically has the poorest water quality of any reach of the river. Reach 5 and its tributaries (Bear Creek and Mud and Salt sloughs) do not meet water quality criteria applicable to some designated beneficial uses. In addition to TMDLs and Basin Plan amendments currently in place or being developed for Reaches 3 and 4, TMDLs were developed to address selenium in Salt Slough and the Grasslands Drainage Area.

Interim Flows are released from Friant Dam by Reclamation as defined by the Exhibit B Settlement hydrographs and as constrained by downstream capacity and seepage limitations. These flows would be subject to flexible flow provisions and other ramping and flow schedule revisions, as recommended by the Restoration Administrator (RA). Flow ramping rates and stable flow durations will depend on RA recommendations and real-time flow management decisions based on the available monitoring information.

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be potential for negative impacts to water quality and hydrology due to unchecked spread of invasive vegetation.

Proposed Action

The Proposed Action would include use of formulations of glyphosate and imazapyr approved for use over or near waterways (as specified by applicable laws and regulations, and by EPA guidance (EPA 2000a, b, c). These herbicides are documented to be of low-toxicity to fish, other aquatic organisms, and to wildlife (EPA 2012). The herbicides would be used in accordance with label directions and only by licensed applicators approved by the California Department of Pesticide Regulations (DPR). Through incorporation of general avoidance protocols, the Proposed Action will have less no adverse impacts to water quality.

3.3 Cultural Resources

Cultural resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the NHPA requires the Federal Government to take into consideration the impacts of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (National Register). Those resources that are on or eligible for inclusion in the National Register are referred to as historic properties.

The San Joaquin Valley is rich in historical and prehistoric cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18th Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The San Joaquin Valley supported extensive populations of Native Americans, principally the Northern Valley Yokuts, in the prehistoric period. Cultural studies in the San Joaquin Valley have been limited. The conversion of land and intensive farming practices over the last century has probably disturbed many Native American cultural sites.

3.3.1 Affected Environment

Cultural resources are defined as prehistoric and historic-era archaeological sites, Traditional Cultural Properties, Sites of Religious and Cultural Significance, and architectural properties (e.g., buildings, bridges, and structures). This definition includes historic properties as defined by the National Historic Preservation Act (NHPA).

Historic-era resources identified through formal recordation in on-site records, California Department of Parks and Recreation property inventory forms (Historic Resources Inventory Form Number 523), or through other state or local landmark inventory programs, are referred to in this analysis as "known" or "previously recorded" resources. To develop sensitivity assessments, archival research and historic mapping were undertaken. The actual presence or integrity of historic-era architectural resources identified only through archival research and historic mapping is unknown, and these are referred to in this study as "identified resources."

Known cultural resources within the Restoration Area include several places of importance to the various Yokuts Tribes in particular. Some of the sites are close to the river. Major areas of resource concentrations appear to be in Firebaugh, Friant, the lower river from Fremont Ford to the Stanislaus County border, Herndon, Lanes Bridge, various current and former river alignments in the Sanjon de Santa Rita, and a number of sloughs and river locales north of San Luis Island.

Cultural resource archival records are relatively limited within the Restoration Area. Based largely on the Central California and San Joaquin Valley information centers records search results, 213 cultural resources studies have been documented. Archaeological surveys have inventoried 12 percent of the Restoration Area, as shown in Table 3-2.

**Table 3-2.
Summary of Cultural Resources Results by Reach**

Reach	1	2	3	4	5	Bypasses	Total
Acreage	47,883	23,667	23,600	43,821	17,678	12,750	169,399
Archaeological Survey (%)	24.6	5.1	1.6	9.7	8.3	11.7	12.2
Recorded Archaeological Sites (resources with trinomials)							
Historic-Era	15	1	0	2	0	0	18
Prehistoric	42	7	0	12	18	5	84
Prehistoric/Historic-Era	5	0	0	2	0	0	7
Total	62	8	0	16	18	5	109
Recorded Historic-Era Architecture							
Primary Number Only	20	0	1	1	3	0	25
Caltrans Bridge Inventory	4	0	0	0	1	0	5
Partially Documented	10	0	0	0	0	0	10
Archaeological Sites with Architecture ¹	3	1	0	2	0	0	6
From Fresno County Historic Places List ⁴	–	–	–	–	0	0	10
Total	37	1	1	3	4	0	56
Potential Prehistoric Surface Site Distribution³							
Using Survey Results by Reach	171	59	52 ²	82	156	17	536
Buried Prehistoric Site Potential							
Very Low-Low (%)	31	41	14	41	38	73	35
Moderate (%)	0	0	6	20	4	22	8
Very High-High (%)	57	54	78	37	55	3	51
Potentially Sensitive Historic-Era Archaeological Sites							
Number	139	20	23	26	6	0	214
%	65	9.3	10.7	12.1	2.8	0	99.9
Potential Historic-Era Architectural Resources							

San Joaquin River Restoration Program

Number	841	90	101	94	121	14	1,242
By Weighted Value	942	123	141	138	121	13	–

Notes:

- ¹ Also counted in archaeological site numbers.
- ² Average density for Reaches 2 and 4 (2.2) used to generate this value.
- ³ Conservative estimate—higher densities indicated by landform age data.
- ⁴ Locations uncertain.

Key:

– = Not available

A total of 109 archaeological sites have been recorded within the Restoration Area. This includes 84 prehistoric sites, 18 historic-era sites, and 7 sites with both prehistoric and historic-era components. Most are concentrated in Reach 1 (57 percent) where inventory efforts have been the most rigorous, while Reach 3 lacks documented sites (with only 2 percent surveyed).

The 91 prehistoric sites and components include 35 major residential sites, 11 residential sites, 28 bedrock milling localities, 11 artifact scatters, 3 artifact scatters with bedrock milling, 2 lithic scatters, and 1 site with a single house pit. Many of the major residential sites have mounds (n=7), house pit depressions on the surface (n=21), and human remains (n=17). Human remains have also been noted at six other sites.

The 25 historic-era archaeological sites include 8 refuse deposits, 7 structural remains, 4 structural remains with refuse deposits, 4 water-related resources (2 check dams, 1 ditch, and 1 canal with refuse), and 2 railroad grades. Those with structural remains include residential and commercial buildings, Dickerson’s Ferry, and ranches.

A total of 56 historic-era architectural resources were variously documented within the Restoration Area. These include 32 residential and commercial buildings, 7 bridges, 6 canals, 3 ferries, 2 dams, and 6 miscellaneous (1 rookery, 2 forts, 1 point, 1 pueblo, and 1 railroad grade). Most are concentrated in Reach 1 where inventory efforts have been the most rigorous.

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be no Federal undertaking as described in the in the NHPA at Section 301(7). As a result, Reclamation would not be obligated to implement Section 106 of that NHPA and its implementing regulations at 36 CFR Part 800. Because there is no undertaking, impacts to cultural resources would not be evaluated through the Section 106 process. All operations would remain the same resulting in no impacts to cultural resources.

Proposed Action

Invasive vegetation would be removed above ground level to avoid soil disturbance. Herbicide application would occur on recently cut stumps or applied following regrowth. Equipment would be used for debris removal but would be restricted to existing vehicle access roads.

The Proposed Action would not cause a substantial adverse change in the significance of a historical or archeological resource, not directly or indirectly destroy a unique paleontological resource/site or geologic feature, or likely disturb any human remains. Therefore, there would be no adverse impact to Cultural Resources.

3.4 Indian Trust Assets

3.4.1 Affected Environment

Indian Trust Assets (ITA) are legal interests in assets that are held in trust by the U.S. Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. “Assets” are anything owned that holds monetary value. “Legal interests” means there is a property interest for which there is a legal remedy, such a compensation or injunction, if there is improper interference. ITA cannot be sold, leased or otherwise alienated without the United States’ approval. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something; which may include lands, minerals and natural resources in addition to hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITA may be located off trust land.

Reclamation shares the Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain ITA reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

3.4.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not have a federal action and conditions would remain the same as existing conditions; therefore, there would be no impacts to ITA.

Proposed Action

Activities associated with the Proposed Action would not impact ITA. The nearest ITA is Table Mountain Rancheria which is located approximately 4 miles East of the Project Area.

3.5 Socioeconomic Resources

3.5.1 Affected Environment

The majority of the service areas within the Proposed Action area are rural and agricultural. The agricultural industry significantly contributes to the overall economic stability of the San Joaquin Valley. There are many small communities where farm workers live, and many small businesses that support the agricultural industry. These communities and businesses rely on the efficient and cost-impactive utilization and supply of water to the surrounding agricultural lands to sustain the agriculturally-based economy. Depending upon the variable hydrologic and economic conditions, water transfers and exchanges can be prompted. Economic variances in the community may include fluctuating agricultural prices, insect infestation, changing hydrologic conditions, increased fuel and power costs. The cost and availability of water has historically had a direct secondary economic impact on the communities of the area as it can drive the type of crop grown or contribute to the potential fallowing of land.

3.5.2 Environmental Consequences

No Action

Under the No Action Alternative, economic conditions would reasonably be expected to continue at the baseline level.

Proposed Action

The Proposed Action would increase economic opportunity in the vicinity of the Proposed Action Area by providing employment to complete vegetation management activities. The Proposed Action is anticipated to add many local seasonal jobs. Therefore, the proposed action will not adversely impact socioeconomic resources.

3.6 Environmental Justice

3.6.1 Affected Environment

The February 11, 1994, Executive Order 12898 requires all federal agencies to address potentially disproportionate impacts to economically disadvantaged and minority populations.

Many cities and towns in the San Joaquin Valley are steeped in the agricultural community, and include high percentages of minority and/or low-income populations. Some of these communities support centers of migrant laborers, and populations tend to increase during the late summer harvest. The San Joaquin Valley's migrant workers are typically of Hispanic origin, from Mexico and Central America. Migrant workers depend exclusively on seasonal agricultural practices to provide sufficient income to support themselves and their families. The agricultural industry and agricultural businesses are the main industry in the Proposed Action area, and thus, are the main industries to provide employment opportunities for minority and/or disadvantaged populations.

3.6.2 Environmental Consequences

No Action

The No Action Alternative would not reasonably be expected to impact to minority and/or disadvantaged populations within the vicinity of the Proposed Action Area.

Proposed Action

Local agricultural unemployment rates suggest that any actions that maintain seasonal jobs would be considered beneficial and the Proposed Action would have no adverse impact on low-income or minority populations.

3.7 Air Quality

Section 176 (c) of the Clean Air Act (CAA) (42 U.S.C. 7506 (c)) requires that any entity of the Federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110 (a) of the CAA (42 U.S.C. 7401 (a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact conform to the applicable SIP before the action is taken.

On November 30, 1993, the Environmental Protection Agency promulgated final general conformity regulations at 40 CFR 93 Subpart B for all federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed federal action in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutant caused by the Proposed Action equal or exceed certain *de minimis* amounts thus requiring the federal agency to make a determination of general conformity.

3.7.1 Affected Environment

The project area is located within the San Joaquin Valley Air Basin (SJVAB) which is the second largest air basin in California. Despite years of improvements, the SJVAB does not meet State and Federal health-based air quality standards. The governing body over the SJVAB, the San Joaquin Valley Air Pollution Control District (SJVAPCD), has adopted stringent control measures to reduce emissions and improve overall air quality within the SJVAB.

3.7.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be no change in existing air quality in the project area.

Proposed Action

Under the Proposed Action, activities using large mechanical equipment for vegetation debris removal could result in emissions of PM₁₀ and PM_{2.5} and, thus, these activities would be subject to SJVAPCD Regulation VIII: Fugitive PM₁₀ Prohibitions. The Proposed Action includes implementing measures necessary to comply with SJVAPCD Regulation VIII: Fugitive PM₁₀ Prohibitions (refer to 2.2.4 Environmental Commitments); therefore, project-generated operational emissions would not conflict with or obstruct implementation of an applicable air quality plan, violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase of any criteria pollutant for which the Proposed Action region is nonattainment under an applicable Federal or State ambient air quality standard. Therefore, there will be no adverse impact to air quality as a result of the Proposed Action.

3.8 Aesthetics

Visual resources are described below for the Restoration Area. Overall visual quality was assessed qualitatively with landscapes described as “high,” “moderate,” or “low,” using the following qualitative terms:

- **Vividness** – describes the presence of distinctive landscape features, such as topographic relief, geologic formations, color, or patterns that combine to form a striking or memorable visual pattern.
- **Intactness** – describes the integrity of a landscape and the degree to which it is free from incongruous or out-of-place features that detract from the visual pattern.
- **Unity** – describes the appearance of the landscape as a whole and the degree to which the visual elements maintain a coherent visual pattern.

3.8.1 Affected Environment

Visual resources of the Restoration Area are described in the following sections.

Reach 1

Observers in or adjacent to the river in Reach 1 see a river channel and adjacent vegetated banks and bluffs with views having moderate vividness; however, the concrete structures of Friant Dam and associated diversion structures and canals, buildings, parking lots, and a fish hatchery visible above the river at the upper end of Reach 1A reduce the intactness and unity of views. Downstream from Friant Dam, views are of naturally vegetated open space interspersed with golf courses, instream and offstream gravel operations, orchards, and row crops. Intactness of the views ranges from low in areas of gravel mining

operations to moderate in areas where the riparian corridor and adjacent lands are relatively undisturbed. Unity of the views ranges from low in areas where adjacent land uses produce sharp visual contrasts (disturbed lands adjacent to natural areas) to moderate where land uses have softer edges (riparian corridor adjacent to natural or park lands). The overall visual quality in Reach 1A is low to moderate.

Observers adjacent to the river in Reach 1B experience views with low vividness because of the lack of distinctive landscape features and the disturbed riparian corridor. Intactness of the views is somewhat reduced by the limited riparian vegetation coverage, disturbance resulting from gravel mining operations, and the contrasting managed agricultural landscape; intactness is low to moderate. Overall unity is low to moderate. The overall visual quality in Reach 1B is low.

Reach 2

The topography in Reach 2 is characterized by a sandy, meandering channel and adjacent land cover is primarily agricultural. Observers adjacent to the river in Reach 2 experience views with low vividness because this reach lacks distinctive landscape features, including Mendota Pool. Features of Mendota Pool include several pumps and canals to divert flows for meeting demands. Other features of this reach include the San Mateo Road crossing and the Chowchilla Bypass Bifurcation Structure, which is a major intrusive element. Therefore, intactness of this reach is considered low to moderate. Unity is low to moderate also because of intrusion of artificial structures and the contrast between the managed agricultural landscape and the meandering, sparsely vegetated stream channel in this reach. The overall visual quality in this reach is low.

Reach 3

The topography in Reach 3 is characterized by a sandy, meandering channel. This reach conveys perennial flows of Delta water released from the Mendota Pool to Sack Dam, where flows are diverted to the Arroyo Canal. The channel meanders approximately 23 miles through a predominantly agricultural area except where the city of Firebaugh borders the river's west bank for 3 miles. One bridge crosses the river in this reach. A narrow, nearly continuous band of riparian vegetation consisting primarily of cottonwood riparian forest is present on at least one side of the channel, and diversion structures are common in this reach.

Observers adjacent to the river in Reach 3 experience views with low vividness because of a lack of distinctive landscape features. Intactness of the views is low to moderate because of the presence of dams, diversion structures, and urban development, which intrude on views of the river corridor and adjacent agricultural landscape. Overall, the unity of the views is low in the vicinity of the diversion structures and moderate where the distinctive riparian corridor meanders through the more managed agricultural landscape. The overall visual quality in this reach is moderate.

Reach 4

Observers adjacent to the river in Reach 4A experience views with low vividness because of the lack of distinctive landscape features. Intactness of the views in this reach is low because of the presence of intruding artificial structures and the degraded condition of the

riparian corridor. Unity is low because of the sharp contrast between the riparian area and the adjacent managed agricultural landscape. The overall visual quality in this subreach is low.

Observers adjacent to the river in Reach 4B1 experience views with low vividness because of the lack of distinctive landscape features. Intactness of the views is generally low (along the altered riparian area) to moderate (across adjoining agricultural land cover). Unity is low because of the sharp contrast between the vegetation-choked river channel and the adjacent managed agricultural landscape. The overall visual quality in this subreach is low.

Observers adjacent to the river in Reach 4B2 experience views with moderate vividness because of the wider floodplain with surrounding natural vegetation, and intactness is moderate because of the limited number of artificial structures that intrude on the views. Unity is moderate also because of the wider riparian corridor and adjacent areas of natural habitat. The overall visual quality in this subreach is moderate.

Reach 5

Observers adjacent to the river in Reach 5 experience views with moderate vividness because of the views of the wider floodplain, with meandering riparian corridors and expanses of surrounding natural vegetation. Intactness of the views is moderate because of the uninterrupted expanses of natural habitat and the limited number of artificial structures that intrude on the views. Unity of the views is moderate because the natural features of the landscape lack abrupt contrasts or changes. The overall visual quality in this reach is moderate.

Chowchilla Bypass and Tributaries

Observers in or adjacent to the bypass experience views with low vividness because of the flat terrain and sparse vegetation, which are lacking in distinctive landscape features. The bifurcation structure, levees, and barren ground detract from the intactness of the views. Unity is low because the disparate landscape features do not form a coherent visual pattern. The overall visual quality of the bypass area is low. Visual qualities of the tributaries are similar to those of the bypass, with low vividness, low intactness, and low unity. Overall, visual qualities along these tributaries are low.

Eastside Bypass, Mariposa Bypass, and Tributaries

Observers in or adjacent to the Eastside and Mariposa bypasses experience views with low vividness because of flat terrain and short, uniform vegetation lacking in distinctive landscape features. The intactness of the views is moderate because of the limited number of artificial structures that intrude on the views. Unity is low because the disparate landscape features do not form a coherent visual pattern. The overall visual quality of the bypass area is low. Visual qualities of the Eastside Bypass tributaries, including Deadman, Owens, and Bear creeks, are similar to those of the bypass, with low vividness, low intactness, and low unity. Overall, visual qualities along these tributaries are low.

3.8.2 Environmental Consequences

No Action

Changes to aesthetic resources are relatively subjective, but there is potential under the No Action Alternative for ongoing adverse impacts to aesthetic resources due to spread of monotypic, visually displeasing stands of invasive vegetation.

Proposed Action

Although the Proposed Action could result in changes to the visual setting following removal of invasive vegetation, these changes would not have an adverse impact on a scenic vista, would not adversely damage scenic resources, and would not adversely degrade the existing visual character the Restoration Area. The changes would be temporary as native riparian vegetation would establish following invasive vegetation removal. Changes to aesthetic resources are relatively subjective, but there is potential for benefits to aesthetic resources through long-term establishment of native riparian vegetation at invasive vegetation treatment sites. Therefore, there will be no adverse impact to Aesthetics.

3.9 Hazards and Hazardous Materials

3.9.1 Affected Environment

Anthropogenic sources of hazardous materials and waste may exist in both the agricultural and urbanized portions of the Restoration Area and potential borrow sites. Contaminated sites generally are the result of unregulated spills of hazardous materials, such as gasoline or industrial chemicals, which result in unacceptable levels of toxic substances in soil or water that pose risks to human health and safety. Contamination also may result from ongoing land uses that generate substantial amounts of hazardous wastes, such as mines and landfills.

The hazardous waste sites listed below were located within 1,500 feet of the centerline of the San Joaquin River in the Restoration Area as compiled from the California Department of Toxic Substances Control's (DTSC's) *Cortese List*, SWRCB's Geotracker (2008), and EPA's Enviromapper databases.

Areas currently or historically used for agricultural purposes, such as a large portion of the Restoration Area, are likely to have received pesticide, herbicide, and fertilizer applications. Therefore, it should be assumed that all geographic areas discussed below are potentially contaminated with residual agricultural chemicals.

Reach 1. Two sites in Reach 1 are known to contain hazardous materials and are considered to have "open" SWRCB cleanup status. Palm Bluffs Corporate, located at 7690 Palm Avenue, Fresno, is listed as a land disposal site. Southern Pacific Transportation Company, located at 17390 Friant Road, Friant, is listed for potential chromium and other metals contamination.

Reach 2. One site in Reach 2 is listed in the above-mentioned databases. Mendota Landfill is considered by SWRCB to have open status and potential volatile organic compound contamination.

Reach 3. The SWRCB lists eight sites for which remediation has been completed. The following sites in Reach 3 are known to contain hazardous materials and are undergoing site assessment:

- Ag and Industrial Supplies leaking underground storage tank (LUST) cleanup site (gasoline) at 7377 River Drive, Firebaugh
- Italo's Mini Mart LUST cleanup site (gasoline) at 785 N Street, Firebaugh
- Ramirez property LUST cleanup site (diesel) at 1435 Ninth Street, Firebaugh
- Calpine Containers LUST cleanup site (gasoline) at 1440 M Street, Firebaugh

Reaches 4 and 5. No sites listed in the above-mentioned databases are located in Reaches 4 and 5.

Chowchilla Bypass and Tributaries. No sites listed in the above-mentioned databases are located in the Chowchilla Bypass portion of the Restoration Area.

Eastside Bypass, Mariposa Bypass, and Tributaries. No sites listed in the above-mentioned databases are located in the Eastside and Mariposa bypasses portions of the Restoration Area.

3.9.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be no change in existing hazards and hazardous materials in the project area.

Proposed Action

Although the Proposed Action could involve application of herbicidal chemicals to control and manage nonnative invasive plant species, the Proposed Action would not create an adverse hazard to the public or the environment. The herbicides used near water will be aquatic-approved formulations of glyphosate and imazapyr are not expected to result in population decreases in wildlife and fish species. Sites would be surveyed to avoid any special status species by a qualified biologist prior to spraying. Therefore, use of Hazards and Hazardous Materials would not result in any adverse impacts.

3.10 Noise

3.10.1 Affected Environment

The existing noise (and vibration) environment in and surrounding the Restoration Area is influenced by transportation noise emanating from vehicular traffic on area roadways,

train operations, and aircraft overflights. Agricultural activities, mining operations, urban uses, light industrial uses, commercial uses, and recreational uses are nontransportation noise sources that also contribute to the existing background noise levels in the Restoration Area. Sources of noise in the Restoration Area include the following:

- Vehicular Traffic
- Railroads
- Aeronautical Sources
- Parks and School Playgrounds
- Agriculture
- Industry
- Quarries

3.10.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be no change in existing noise in the project area.

Proposed Action

Although the Proposed Action does not involve any construction-related activities, it does involve plant survey and removal activities involving some mechanical equipment. However, the noise-related impacts due to these activities would be temporary in nature and would not result in any exposure of persons to or generation of noise levels in excess of applicable standards, exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels, a substantial permanent increase in ambient noise levels, or a substantial temporary or periodic increase in ambient noise levels. Therefore, there would be no adverse impacts from noise associated with the Proposed Action.

3.11 Environmental Consequences Analysis

This section presents the environmental consequences and analysis of cumulative impacts potentially resulting from implementation of the Proposed Action. Because the No-Action Alternative has not changed from the conditions described in the WY 2010 Final EA/IS, the analysis of the potential impacts associated with the No-Action Alternative for each resource area remains unchanged and is not repeated here.

The following sections summarize information and findings from the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project relevant to implementation of the Proposed Action. Section 3.11.1 includes a discussion of the resource topics that would not result in any new adverse impacts or substantial increase in the severity of impacts previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.

3.11.1 Resource Topics Not Requiring Further Evaluation

It was determined that the following resource topics would not result in any adverse impacts due to implementation of the Proposed Action.

Geology and Soils

The Proposed Action would not involve conditions that could result in seismic activity or related ground failure or landslides. Although the Proposed Action would alter vegetative cover by removing invasive plants, changes would be temporary and minimized by reseeding/replanting with native species to prevent soil erosion. Additionally, the Proposed Action would not increase the risk of landslides, lateral spreading, liquefaction, or collapse, would not increase risks to life or property due to the presence of expansive soils within the region, and would not involve temporary or long-term installation or use of wastewater disposal systems. Therefore, there will be no adverse impacts to Geology and Soils.

Land Use and Planning

The Proposed Action would not physically divide any established community, not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental impact, and not conflict with any applicable habitat conservation plan or natural community conservation plan. Implementation of the Proposed Action would have no adverse impacts to Land Use and Planning.

Mineral Resources

Implementation of the Proposed Action would not result in the loss of availability of known resources that would be of value to the region or the residents of the state, and would not result in the loss of availability of a locally important mineral resource recovery site. Therefore, there would be no adverse impacts to Mineral Resources.

Population and Housing

Implementation of the Proposed Action would not directly or indirectly induce substantial population growth in an area, displace substantial numbers of existing homes or people. Therefore, there would be no adverse impacts to Population and Housing.

Public Services

The Proposed Action would not result in substantial adverse physical impacts associated with the provision of new or physically altered public facilities, or the need for new or physically altered public facilities in order to maintain acceptable service ratios, response times, or other performance objectives for public services. Therefore, the Proposed Action would not result in adverse impacts to Public Services.

Recreation

The Proposed Action would not result in an increase in the use of existing neighborhood and regional parks or other recreational facilities and would not include construction or expansion of recreational facilities. There would be no adverse impacts to recreation from the Proposed Action.

Transportation/Traffic

The Proposed Action would not cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system, exceed, either individually or cumulatively, a level of service standard, result in a change in air traffic patterns, substantially increase hazards due to a design feature or incompatible uses, result in inadequate emergency access, result in inadequate parking, or conflict with adopted policies, plans, or programs supporting alternative transportation. Implementation of the Proposed Action would not result in adverse impacts to transportation or traffic.

Utilities and Service Systems

Because the Proposed Action does not involve generation or treatment of wastewater or solid waste, demands for related facilities would not increase. Therefore, there would be no adverse impacts to utilities and service systems.

3.12 Cumulative Impacts

Invasive vegetation monitoring and management would not have any controversial or highly uncertain impacts, or involve unique or unknown environmental risks. The Proposed Action would not trigger other actions and does not contribute to cumulative impacts to physical resources when added to other actions.

The remainder of the SJRRP actions, including the continued release of future flows from Friant Dam, the recapture of flows at specific San Joaquin River diversion and/or pumping facilities, and future site-specific actions are all reasonably foreseeable and required under the Settlement and the Act. Future program actions related to the SJRRP are addressed in the Draft San Joaquin River Restoration Program Environmental Impact Statement/Environmental Impact Report, which is scheduled to be finalized in July 2012.

There are reasonably foreseeable actions in the Restoration Area not expected to involve Federal funding and/or permitting (e.g., some private development and some management activities). Also, an undetermined number of future actions could go forward without a Section 404 permit to fill wetlands, an incidental-take permit through Section 10 of the Act, or other Federal action. Future actions that could potentially impact resources include actions that affect or result in any of the following:

- Habitat conversion or fragmentation
- Herbicide or pesticide applications
- Vegetation management, including along waterways
- Grazing practices
- Crop selection (including crop types cultivated, fallowing or idling of cropland, and abandonment of agricultural land)
- Ground-disturbing activities (including ripping of soils)
- Discharge of contaminants into waterways
- Presence of humans along waterways on agricultural lands, or in natural vegetation
- Predator abundance (e.g., coyotes)

- Dispersal and establishment of invasive species
- Flow regimes of waterways
- Use of off-road vehicles and traffic levels on local roads

All of these activities and scenarios can degrade habitat or cause the injury or death of listed species. These activities regularly change in response to market conditions and new technologies. For some of these activities (such as some agricultural practices), attempting to predict future changes and their consequences for listed species would be speculation. Nonetheless, the vulnerability of listed species to different types of actions varies, many actions are associated with particular land uses or management practices, and the distribution of potential habitat with regard to existing and planned land uses is known. Therefore, this analysis uses these known relationships between types of non-Federal actions and impacts on species, and among habitats, non-Federal actions, and land use, as the primary basis for evaluating the cumulative impacts of foreseeable future actions.

The Proposed Action was found to have no adverse impacts on water resources, land use, biological resources, cultural resources, ITA, socioeconomic resources, environmental justice, air quality, or global climate change and therefore there is no contribution to cumulative impacts on these resources areas. Overall, there would be no cumulative impacts caused by the Proposed Action.

4.0 Consultation and Coordination

4.1 National Environmental Policy Act

This EA has been prepared pursuant to NEPA, which was signed into law in 1969 (42 USC Section 4321 et seq.). In addition, it was prepared in accordance with CEQ regulations for implementing NEPA, 40 CFR Parts 1500- 1508, and General Services Administration (GSA) Order ADM 1095.1F. NEPA provides a commitment that Federal agencies will consider the environmental impacts of their proposed actions and adhere to regulations, policies, and programs to the fullest extent possible, in accordance with NEPA's policies of environmental protection. This EA assesses if the Proposed Action would cause any adverse environmental impacts. If it is determined that the Proposed Action would have no adverse environmental impacts, a FONSI will be signed.

4.2 Fish and Wildlife Coordination Act of 1934 (16 USC § 661 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The Proposed Action does not involve federal water development projects; therefore, the FWCA does not apply.

4.3 Endangered Species Act of 1973 (16 USC § 1531 et seq.)

Section 7 of the Act requires Federal agencies, in consultation with the Secretary of the Interior, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

As part of the Act Section 7 requirements for the Proposed Action, a list of Federal threatened and endangered species, species proposed for listing, and species that potentially occur within the study area was obtained from the Service, NMFS, and for the Water Year 2010 Interim Flows EA. Reclamation used these lists and engaged in informal consultation with the Service and NMFS on the Proposed Action. A Biological Assessment was prepared by Reclamation and delivered to the Service and NMFS on April 4, 2012. NMFS and USFWS concurred with Reclamation's determination that the project is not likely to adversely affect federally-listed species or critical habitat on August 17, 2012 and August 30, 2012, respectively.

4.4 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act is designed for taking immediate action to conserve and manage the fishery resources found off the

coasts of the United States, and the anadromous species and continental shelf fishery resources of the United States. Consultation with NMFS is required when any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, may adversely affect any essential fish habitat (EFH). Within the study area, EFH is found in the San Joaquin River downstream from the Merced River confluence, in three major San Joaquin River tributaries (Merced, Tuolumne, and Stanislaus rivers), and in the Delta. A Biological Assessment that incorporates the EFH assessment was submitted by Reclamation to NMFS on April 4, 2012 and consultation is ongoing.

4.5 National Historic Preservation Act (16 USC § 470 et seq.)

The NHPA of 1966, as amended (16 USC 470 *et seq.*), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the impacts of an undertaking on historic properties, properties that are eligible for inclusion in the NRHP. The 36 CFR Part 800 regulations implement Section 106 of the NHPA.

Section 106 of the NHPA requires federal agencies to consider the impacts of federal undertakings on historic properties, properties determined eligible for inclusion in the NRHP. Compliance with Section 106 follows a series of steps that are designed to identify interested parties, determine the APE, conduct cultural resource inventories, determine if historic properties are present within the APE, and assess impacts on any identified historic properties. The activities associated with the Proposed Action would include no new ground disturbance, no change in land use, and the use of existing conveyance features to move and store water. Reclamation has determined that there would be no potential to affect historic properties by the Proposed Action pursuant to 36 CFR 800.3(a)(1).

4.6 Migratory Bird Treaty Act of 1918 (16 USC § 703 et seq.)

The MBTA implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the MBTA provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the MBTA, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action has incorporated environmental protective measures to avoid impacts to birds while treating invasive vegetation which may have some value to listed species of birds protected by the MBTA; therefore, the Proposed Action would have no impact on birds protected by the MBTA.

4.7 Executive Order 113007 and American Indian Religious Freedom Act of 1978 – Indian Trust Assets and Sacred Sites on Federal Lands

Executive Order 113007 and the American Indian Religious Freedom Act of 1978 are designed to protect Indian Trust Assets, accommodates access and ceremonial use of Native American sacred sites by Native American religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and protect and preserve the observance of traditional Native American religions. The Proposed Action would not violate these protections.

4.8 Executive Order 12898 – Environmental Justice in Minority and Low-Income Populations

Executive Order 12898 requires Federal agencies to identify and address disproportionately high and adverse human health and environmental impacts of Federal programs, policies, and activities on minority and low-income populations. The Proposed Action has been assessed for potential environmental, social, and economic impacts on minority and low-income populations. Minority and low-income populations would not be disproportionately exposed to adverse impacts relative to the benefits of the action, and would benefit from employment opportunities created by implementation of the Proposed Action.

4.9 Central Valley Project Improvement Act

Public Law 102-575, the Reclamation Projects Authorization and Adjustment Act of 1992, includes Title 34, the Central Valley Project Improvement Act (CVPIA). The CVPIA amended previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic water supply uses, and fish and wildlife enhancement as having equal priority with power generation. The Proposed Action is consistent with CVPIA.

4.10 Additional Implementation Considerations

Additional considerations, such as potential environmental, regulatory, or legal issues, which could further limit implementation of Invasive Vegetation Monitoring and Management are summarized below.

4.10.1 Access

CDFG Lands: A letter of authorization to conduct work on non-hunt days is needed to implement project activities on CDFG lands. To obtain a letter of authorization the CDFG must review the project description, specifically the invasive weed removal methods. River Partners will coordinate with CDFG to ensure project activities are in line with Wildlife Management Area objectives. A Letter of Authorization to conduct work on land managed by CDFG will be obtained prior to conducting work.

Service Lands: National Wildlife Refuge System General Special Use Application and Permit (FWS Form 3-1383-G) is needed to implement project activities on Service lands (e.g. San Luis National Wildlife Refuge and Merced National Wildlife Refuge). River Partners is in communication with Service Refuge staff to ensure such access is appropriately permitted.

Department of Parks and Recreation Lands: A Right of Entry permit is needed to conduct project activities on State Parks lands (e.g. Great Valley Grasslands State Park and Hatfield State Park). An Application and Permit to Conduct Biological, Geological, or Soil Investigations/Collections will be filed with State Parks prior to commencement of any monitoring activities.

Private lands- Temporary Entry Permit: To conduct project activities on private lands, project staff will work with private landowners to develop Temporary Entry Permits (TEPs). TEP's will specify how environmental surveys will be conducted, detail the controls landowners retain for entry to their property for surveys and weed control activities, and detail the private property rights under the TEP. Project partners will work with willing landowners to develop a form TEP for this project. Until a form TEP is agreed upon between project partners and landowners, access to private lands will be conducted on a one-on-one basis with willing landowners.

4.10.2 Implementation Coordination

Implementing the Invasive Vegetation Monitoring and Management Project would require coordination with Federal, State, and/or local agencies, as well as landowners.

5.0 Errata

Revisions to the text were identified based on comments received on the Draft Invasive Vegetation Monitoring and Management EA, and ESA concurrence letters from the Service and NMFS. The revisions to the Draft Invasive Vegetation Monitoring and Management EA are one component of the materials that comprise the Final Invasive Vegetation Monitoring and Management EA. This errata sheet identifies certain modifications and corrections to the Draft Invasive Vegetation Monitoring and Management EA, which have been identified in response to public and agency comments received during the public review and comment period. The changes presented below provide additional clarification, additional information, and/or correct minor errors. The changes do not alter the conclusions related to environmental impacts that were presented in the Draft Invasive Vegetation Monitoring and Management EA. Additions to the Draft Invasive Vegetation Monitoring and Management EA are included in double underline and deletions are included in ~~striketrough~~.

5.1 Section 1 – Purpose and Need for Action

Section 1.1– Introduction

In Appendix F of the WY 2010 Interim Flows Project EA/IS, the WY 2011 Interim Flows Project Supplemental EA, and the WY 2012 Interim Flows Project Supplemental EA Reclamation made an environmental commitment to monitor and manage invasive vegetation with potential to compromise successful implementation of SJRRP. On September 26, 2011 Reclamation entered into a grant with the San Joaquin River Parkway and Conservation Trust (Trust) to meet this commitment.

Section 1.3.1– Purpose and Need for Action: Third, Fifth, and Sixth Paragraphs, the following language has been changed:

The SJRRP will implement the Settlement and the Act. The “Implementing Agencies” responsible for managing and implementing the SJRRP include the U.S. Department of the Interior, through Reclamation and the U.S. Fish and Wildlife Service (~~SERVICE~~) (Service), the U.S. Department of Commerce through the National Marine Fisheries Service (NMFS), and the State of California (State) Natural Resources Agency through DWR and the California Department of Fish and Game (CDFG).

Interim Flows rewetted portions of the San Joaquin River channel that were previously dry except during flood flows. The dry portions of the channel did not support substantial riparian vegetation, and the bare substrates are considered to be prone to recruitment of either native or invasive vegetation. Invasives could compromise the establishment of

native habitat to support Chinook salmon and SJRRP's ability to achieve the Restoration Goal. Additionally, the release of Interim Flows could spread invasive species to other portions of the river. For this reason, the *WY 2010 Interim Flows Project EA/IS*, the WY 2011 Interim Flows Project Supplemental EA, and the WY 2012 Interim Flows Project Supplemental EA committed to monitoring and managing invasive vegetation.

As discussed earlier, Reclamation entered into a grant with the Trust, which is a member of the San Joaquin River Partnership (Partnership), to fulfill the commitments made in the *WY 2010 Interim Flows Project EA/IS*, the WY 2011 Interim Flows Project Supplemental EA, and the WY 2012 Interim Flows Project Supplemental EA. The Partnership includes 11 nonprofit member organizations and an array of scientists, volunteers, and conservationists who support full implementation of SJRRP by working with private landowners, government agencies, and community organizations. Three members of the Partnership, River Partners (RP), the Trust, and The Nature Conservancy (TNC), proposed to monitor and manage invasive vegetation in fulfillment of Reclamation's environmental commitments in the *Water Year 2010 EA and FONSI*, the WY 2011 Interim Flows Project Supplemental EA, and the WY 2012 Interim Flows Project Supplemental EA. Their previous successes in natural resources management have been a direct result of their ability to work in Central Valley communities to build coalitions and partnerships with federal, state and local agencies and other stakeholders. Their history of working with local communities is important, because they have engaged local youth, agricultural labor crews, and local students, to monitor and manage invasive plants on the river. These members view their involvement as an opportunity to address high unemployment in the San Joaquin Valley and reach out to the locals who are often unaware or uninformed about SJRRP.

5.2 Section 2 – Description of Alternatives

Section 2.2 Proposed Action, the following language has been changed:

Surfactants would be limited to Agri-Dex, LI-700, Hasten Modified Vegetable Oil, Freeway, Dyne-Amic, Kinetic, and Pro-Spreader Activator, as described in Table 2-3.

Section 2.2.1– Invasive Plant Removal, Methods, fourth bullet, the following language has been changed:

- Limited chemical treatment by hand application would include herbicides ~~in both aquatic and terrestrial formulations~~ and their respective active ingredient: ~~terrestrial formulations of glyphosate (Rodeo, AquaMaster, and AquaNeat/Roundup [respectively]) (glyphosate) Habitat (imazapyr), (Stalker [respectively]), and Garlon 4 and Pathfinder II (triclopyr BEE), Telar (chlorsulfuron), and Milestone (aminopyralid). Roundup, Garlon 4, Pathfinder II, Telar, and Milestone will only be used in areas outside the riparian zone, defined as a 20-foot buffer (at minimum) away from the ordinary high water mark of the San Joaquin River. Only Rodeo, Aquamaster, and Habitat would be used in the riparian zone. No~~

herbicides would be used in active waterways. would not be used within an Environmentally Sensitive Area (ESA) restricting herbicide use within 20 feet of active waterways. On floodplains at least 20 feet from active waterways, Garlon 4 would be used rather than Garlon 3a because it is less hazardous to workers. All of these formulations have been approved for use by the U.S. Environmental Protection Agency (EPA), with the aquatic formulations of these herbicides being approved for use over or near waterways (as specified by applicable laws and regulations, and by EPA guidance (EPA 2000a, b, c). These herbicides are documented to be of low toxicity to fish, other aquatic organisms, and to wildlife (EPA 2012). The herbicides would be used in accordance with label directions and only by licensed applicators approved by the California Department of Pesticide Regulations (DPR). Tables 2-2 and 2-3 summarize herbicides and surfactants proposed for use during the Project.

Table 2-2 Summary of herbicides and use within the proposed action area

<u>Herbicide</u>	<u>Target Veg Species</u>	<u>Riparian Zone (RZ) and/ or Terrestrial Floodplain (TF)</u>	<u>Application Method</u>	<u>Surfactants or other adjuvants</u>	<u>Mixture concentrations</u>
<u>Rodeo (glyphosate)</u>	<u>Arundo Pepper weed</u>	<u>RZ</u>	<u>Cut stump paint Sprayer wick</u>	<u>Nonionic surfactant at 0.5-1% v/v concentration</u>	<u>2% solution</u>
<u>Roundup (glyphosate)</u>	<u>Arundo</u>	<u>TF</u>	<u>Cut stump paint Sprayer Wick</u>	<u>Nonionic surfactant at 0.5-1% v/v concentration</u>	<u>2% solution</u>
<u>Aquamaster (glyphosate)</u>	<u>Arundo Pepper weed</u>	<u>RZ</u>	<u>Cut Stump paint Sprayer Wick</u>	<u>Nonionic surfactant at 0.5-1% v/v concentration</u>	<u>2% solution</u>
<u>Habitat (isopropylamine salt of imazapyr)</u>	<u>Woody Species and Arundo</u>	<u>RZ</u>	<u>Cut Stump paint Sprayer Wick</u>	<u>Vegetable oil concentrate at 1.5-2 pints /acre</u>	<u>2-6 pints/acre depending on species treated</u>
<u>Garlon 4 (Triclopyr BEE)</u>	<u>Woody Species</u>	<u>TF</u>	<u>Cut Stump paint Sprayer Wick</u>	<u>Crop Oil concentrate at .5-2% v/v concentration</u>	<u>1-8 quarts/acre depending on species treated</u>
<u>Pathfinder II (triclopyr BEE)</u>	<u>Woody Species</u>	<u>TF</u>	<u>Cut Stump paint Sprayer Wick</u>	<u>No surfactant recommended on label</u>	<u>Not to exceed 8 gallons/acre/year</u>
<u>Milestone</u>	<u>Thistles</u>	<u>TF</u>	<u>Sprayer</u>	<u>Non-ionic</u>	<u>3-7 oz/acre</u>

<u>(aminopyralid)</u>	<u>and some woody species</u>			<u>surfactant at 25-0.5% v/v concentration</u>	<u>depending on species treated</u>
<u>Telar (chlorsulfuron)</u>	<u>Pepper weed</u>	<u>TF</u>	<u>Sprayer</u>	<u>Nonionic surfactant at 0.5-1% v/v concentration</u>	<u>3oz/acre</u>

Table 2-3 Surfactants proposed for use with the herbicides listed in Table 1

<u>Surfactant</u>	<u>Nonionic or Oil Concentrate</u>	<u>Use in the riparian zone (RZ) and/or terrestrial floodplain (TF)</u>
<u>Freeway</u>	<u>Non-ionic</u>	<u>RZ, TF</u>
<u>Pro-Spreader Activator</u>	<u>Non-ionic</u>	<u>TF</u>
<u>Kinetic</u>	<u>Non-ionic</u>	<u>RZ, TF</u>
<u>Agri-Dex</u>	<u>Oil Concentrate</u>	<u>RZ, TF</u>
<u>Dyne-Amic</u>	<u>Oil Concentrate</u>	<u>RZ, TF</u>
<u>Hasten Vegetable Oil</u>	<u>Oil Concentrate</u>	<u>RZ, TF</u>

Section 2.2.1– Invasive Plant Removal, Methods, fifth bullet, the following language has been changed:

- Herbicide application methods would include cut and paint stumps, foliar spray or spot spray, cut and paint of regrowth, prep-and-spray, and stem injection. All applications would be done using hand bottles, backpack sprayers, or all-terrain vehicle (ATV)-mounted power sprayer with low-drift methods (e.g., a coarse drip nozzle). A registered, non-toxic dye to improve detection of overspray would be added to the mixture within all sprayer tank types when using the ATV-mounted power sprayer.

Section 2.2.4 – Environmental Commitments: first paragraph, the following language has been changed:

The following sections describe the environmental commitments that would be conducted in coordination with ~~WY 2012~~ Interim and Restoration Flows implementation to avoid any potentially adverse environmental consequences.

Section 2.2.4 – Environmental Commitments: first bullet, the following language has been changed:

- An on-site biological monitor who is familiar with the San Joaquin River would survey the area for special-status species. Any potential habitat for special-status species would be flagged and identified as an ESA. These areas would be avoided and spraying not permitted within the appropriate buffer area. For areas adjacent

to an active waterway, biologists would identify and flag a 20-foot buffer where herbicide spraying would be restricted according to the measures described in this ~~BA-EA~~.

The following sections describe the environmental commitments that would be conducted in coordination with WY 2012 Interim Flows implementation to avoid any potentially adverse environmental consequences.

Section 2.2.4 – Environmental Commitments: fourth bullet, the following language has been changed:

- Project-related vehicles shall observe a speed limit of 20-mph throughout the site in all project areas, except on county roads and State and Federal highways where posted speed limits will be obeyed. If roads are encountered where 20-mph is excessive, a lower, prudent speed would be maintained.

Section 2.2.4 – Environmental Commitments: third paragraph under “biological”:

Most of the invasive plant removal methods will involve hand crews using weed wrenches, chain saws, and loppers. ~~d~~Disturbance to the overall riparian habitat will be minimal. In cases where flail mowers and masticators will be used, this equipment will be restricted to use adjacent to existing roads, levees, or access paths where there is clear access to invasive plant stands. If stands are located where native vegetation separates the stands from existing roads, levees, or access paths, this equipment will not be used and hand methods will be implemented instead.

Section 2.2.4 – Environmental Commitments: VELB-1, third bullet:

- No equipment (i.e., flail mowers, masticators, and chippers) shall be used within the ~~400~~ 20-foot buffer from the dripline of elderberry shrubs.

Section 2.2.4 – Environmental Commitments: SJKF-1, fourth and fifth bullets:

- Where treatment sites are identified within the established buffer area around potential dens, prioritized focused herbicide application methods would be applied to invasive plants within the ~~60-50~~-foot (or 100-foot in the case of known dens) buffer (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within ~~60-50~~ feet of potential dens are not expected to result in adverse impacts to SJKF as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR.
- Where FKR and SJKF may be found in the same location, then the exclusion zone or buffer area of greater distance will be adhered to.

Section 2.2.4 – Environmental Commitments: GGS-2, fourth bullet:

- Where treatment sites are identified within the 200-foot buffer from potential giant garter snake aquatic habitat, prioritized focused herbicide application methods will be applied to invasive plants within the 200-foot buff (wicking, spray-bottle, coarse droplet nozzles, stem injection, low-pressure backpack or power sprayers directed at close range to target plant). Use of herbicides on invasive plants within 200 feet of potential GGS habitat is not expected to result in adverse effects to GGS as long as the herbicides are applied using focused applications, according to label directions, and by a licensed applicator approved by DPR. Herbicides would not be applied within a 200-foot buffer surrounding potential GGS habitat identified as an ESA.

5.3 Section 3 – Affected Environment and Environmental Consequences

Section 3.2.1 – Water Quality and Hydrology, Affected Environment: fifth paragraph:

Reach 5 typically has the poorest water quality of any reach of the river. Reach 5 and its tributaries (Bear Creek and Mud and Salt sloughs) do not meet water quality criteria applicable to some designated beneficial uses, as shown in Table 3-53.

Section 3.3.1 – Cultural Resources, Affected Environment: second and third paragraphs:

Historic-era resources identified through formal recordation in on-site records, California Department of Parks and Recreation (~~DPR~~) 523 property inventory forms (Historic Resources Inventory Form Number 523), or through other State or local landmark inventory programs, are referred to in this analysis as “known” or “previously recorded” resources.

To develop the sensitivity assessments, archival research and historic mapping were undertaken. The actual presence or integrity of historic-era architectural resources identified only through archival research and historic mapping is unknown, and these are referred to in this study as “identified resources.”

Section 3.5.1 – Socioeconomic Resources, Affected Environment: first paragraph:

There are many small communities where farm workers live, and many small businesses that support the agricultural industry.

Section 3.9.1 – Hazards and Hazardous Materials, Affected Environment: fourth, eighth, ninth paragraphs:

Reach 1. ~~In addition to these two sites for which remediation has been completed, †Two~~ sites in Reach 1 are known to contain hazardous materials and are considered to have “open” SWRCB cleanup status.

Chowchilla Bypass and Tributaries. No sites listed in the above-mentioned databases are located in the Chowchilla Bypass portion of the Restoration Area. Contaminated sites, however, are likely to occur near tributaries of Chowchilla Bypass. Adverse effects on surface water quality that may result from contamination at sites adjacent to the tributaries are discussed in Chapter 14.0, “Hydrology – Surface Water Quality.”

Eastside Bypass, Mariposa Bypass, and Tributaries. No sites listed in the above-mentioned databases are located in the Eastside and Mariposa bypasses portions of the Restoration Area. Adverse effects on surface water quality that may result from contamination at sites adjacent to the tributaries are discussed in Chapter 14.0, “Hydrology – Surface Water Quality.”

Section 3.9.2 – Hazards and Hazardous Materials, Environmental Consequences: second paragraph:

Therefore, use of Hazards and Hazardous Materials would not result in any adverse impacts.

Section 3.11 – Environmental Consequences Analysis: second paragraph:

The following sections summarize information and findings from the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project relevant to implementation of the Proposed Action. ~~Section 3.2.1~~ 3.11.1 includes a discussion of the resource topics that would not result in any new adverse impacts or substantial increase in the severity of impacts previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. ~~Section 3.2.2 describes those resource topics potentially affected by new information provided here for the WY 2012 Interim Flows Project and describes any changes in significance determinations from those presented in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.~~

5.4 Section 4 – Consultation and Coordination

Section 4.3 – Endangered Species Act of 197, second paragraph:

As part of the Act Section 7 requirements for the Proposed Action, a list of Federal threatened and endangered species, species proposed for listing, and species that

potentially occur within the study area was obtained from the Service, NMFS, and for the Water Year 2010 Interim Flows EA. Reclamation used these lists and engaged in informal consultation with the Service and NMFS on the Proposed Action. A Biological Assessment was prepared by Reclamation and delivered to the Service and NMFS on April 4, 2012. NMFS and USFWS concurred with Reclamation's determination that the project is not likely to adversely affect federally-listed species or critical habitat on August 17, 2012 and August 30, 2012, respectively.

Section 4.9 – Central Valley Project Improvement Act, first paragraph:

~~Reclamation's evolving mission was written into law on October 30, 1992, in the form of Public Law 102-575, the Reclamation Projects Authorization and Adjustment Act of 1992, – Included in the law was Title 34, the CVPIA.~~ includes Title 34, the Central Valley Project Improvement Act (CVPIA).

This page left blank intentionally.

6.0 List of Preparers and Contributors

Erin Rice, Natural Resources Specialist, San Joaquin River Restoration Program

Michelle Banonis, Natural Resources Specialist, San Joaquin River Restoration Program

Adam Nickels, Archaeologist, Mid-Pacific Region

Jennifer Lewis, Biologist, SCCAO

This page left blank intentionally.

7.0 Literature Cited

- Brewer, Shannon, Jeff McLain, and Eric Guzman. 2010. Water Temperature Variation from Friant Dam to Sack Dam during the 2009 Fall Interim Flow Period. San Joaquin River Restoration Fisheries Management Work Group. Memo to file.
- EPA (U.S. Environmental Protection Agency). 2000a. *Protecting Endangered Species: Interim Measures for Fresno County*. Pesticides and Toxic Substances H-7506C. Available at <http://www.cdpr.ca.gov/docs/endspec/colist.htm>. Accessed January 5, 2012.
- EPA (U.S. Environmental Protection Agency). 2000b. *Protecting Endangered Species: Interim Measures for Madera County*. Pesticides and Toxic Substances H-7506C. Available at <http://www.cdpr.ca.gov/docs/endspec/colist.htm>. Accessed January 5, 2012.
- EPA (U.S. Environmental Protection Agency). 2000c. *Protecting Endangered Species: Interim Measures for Merced County*. Pesticides and Toxic Substances H-7506C. Available at <http://www.cdpr.ca.gov/docs/endspec/colist.htm>. Accessed January 5, 2012.
- EPA (U.S. Environmental Protection Agency). 2012. *Pesticide Chemical Search*. Office of Pesticide Programs. Available at <http://www.epa.gov/pesticides/chemicalsearch/> Accessed January 5, 2012.
- Endangered Species Recovery Program (ESRP), California State University, Stanislaus. 2009. Habitat Assessment and Surveys for Blunt-Nosed Leopard Lizards (*Gambelia sila*) Along the Eastside Bypass, Merced County, California. Prepared by S. Phillips, C. Wilkinson, F. Vang, and P. Kelly. Prepared for the U.S. Bureau of Reclamation, South-Central California Area Office. September 22, 2009.
- Federal Energy Regulatory Commission (FERC). 2009. Order on Rehearing, Amending License, Denying Late Intervention, Denying Petition, And Directing Appointment of a Presiding Judge for a Proceeding on Interim Conditions. Docket Nos. 2299-065 and 2299-053. Issued July 16, 2009.
- 2009. Final Report of the Presiding Judge on Interim Measures, Project Nos. 229-065 and 229-053. Issued November 20, 2009.
- Hughes, J.M. 1999. Yellow-billed Cuckoo (*Coccyzus americanus*). In *The Birds of North America*, No. 148 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

San Joaquin River Restoration Program

National Oceanic and Atmospheric Association, National Marine Fisheries Service (NMFS). 2009. Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. Issued June 4, 2009.

----- 2010. National Marine Fisheries Service Determination re: Action III.1.3, Action IV.2.1, & Action IV.2.2 of the Biological Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (Opinion). March 29, 2010.

San Joaquin River Restoration Program (SJRRP). 2007a. SJRRP Program Public Involvement Plan. http://www.restoresjr.net/program_library/02-Program_Docs/index.html. Accessed March 22, 2010.

----- 2007b. SJRRP Public Scoping Report. http://www.restoresjr.net/program_library/02-Program_Docs/index.html. Accessed March 22, 2010.

----- 2008. Draft Monitoring Plan for Physical Parameters Technical Memo. http://www.restoresjr.net/program_library/03-Tech_Memoranda/index.html. Accessed March 22, 2010.

----- 2009. Fisheries Management Plan: A Framework for Adaptive Management in the San Joaquin River Restoration Program. http://restoresjr.net/program_library/03-Tech_Memoranda/index.html. Accessed March 24, 2010.

----- 2010a. SJRRP Seepage Daily Evaluation – “Daily Evaluations when Interim Flows are above 475 cfs in Reaches 2A and 3”. <http://www.restoresjr.net/activities/if/index.html>. Accessed March 23, 2010.

----- 2010b. SJRRP Flow Bench Evaluations. <http://www.restoresjr.net/activities/if/index.html>. Accessed March 19, 2010.

----- 2010c. Draft 2009 Annual Technical Report. <http://www.restoresjr.net/activities/if/index.html>. Accessed March 19, 2010.

----- 2010d. SJRRP 2009-2013 Interim Flow Release Program, Water Quality Monitoring Plan. http://www.restoresjr.net/program_library/02-Program_Docs/index.html. Accessed March 22, 2010.

----- 2010e. SJRRP 2009 Water Quality Monitoring Results. <http://www.restoresjr.net/activities/if/index.html>. Accessed March 19, 2010.

----- 2010f. SJRRP Fisheries Implementation Plan 2009-2010 January 12, 2010 Draft Fisheries Management Work Group http://www.restoresjr.net/program_library/02-Program_Docs/DraftFisheries. Accessed May 15, 2010.

----- 2011g. SJRRP 2010 Annual Technical Report. April 11, 2011. <http://www.restoresjr.net/flows/atr.html>. Accessed May 9, 2011.

- 2011h. Monitoring Plan for Central Valley Steelhead. Fisheries Management Workgroup. February 11, 2011.
- 2011i. San Joaquin River Restoration Program Programmatic EIS/EIR. Draft. April 2011.
- United States Department of the Interior, Bureau of Reclamation (Reclamation). 2010. Submittal of Sediment and Water Quality Monitoring Data Called for in Condition 22 of Order WR 2009-0058-DWR. Letter to the State Water Resources Control Board dated January 22, 2010.
- United States District Court, Eastern District of California. 2009. Findings of Fact and Conclusions of Law and Order (Dpcs 82 & 83). Consolidated Delta Smelt Cases, No. 1:09-cv-00407-OWW-DLB. Document 94. Filed May 29, 2009.
- 2010. Memorandum Decision Re Cross-Motions for Summary Judgment on NEPA Issues (Dpcs 82 & 83). Consolidated Salmonid Cases, No. 1:09-cv-1053 OWW DLB. Document 266. Filed March 5, 2010.
- United States Fish and Wildlife Service (USFWS). 1998. Draft Recovery Plan for the least Bell's vireo.
<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B067>. Accessed April 6, 2012.
- United States Fish and Wildlife Service (USFWS). 2001. Endangered and threatened wildlife and plants; 12-month finding for a petition to list the Yellow-billed Cuckoo (*Coccyzus americanus*) in the Western Continental United States. Federal Register. 50 CFR Part 17:38611-626.
- United States Fish and Wildlife Service (USFWS). 2008. Delta Smelt Biological Opinion of the Operating Criteria and Plan for the Continued Operations of the Central Valley Project and State Water Project. Issued on December 15, 2008.