

Draft USJR-Specific Content in the 2022 CVFPP Update and Supporting Documents

Upper San Joaquin River

Regional Flood Management Planning



June 2023

Upper San Joaquin River Regional Flood Management Plan



Executive Summary

This document contains the data and the analyses of several documents to support regional priority planning and advocate for sustainable financial investment in the Upper San Joaquin River (USJR) flood system. This white paper summarizes information specific to the USJR regional flood management planning (RFMP) region that appears in the following documents:

- *2022 Central Valley Flood Protection Plan Update (2022 CVFPP Update)* (California Department of Water Resources [DWR] 2022a)
- *2022 Central Valley Flood Protection Plan Conservation Strategy Update* (DWR 2022b)
- *2022 State Plan of Flood Control Descriptive Document (2022 SPFC DD)* (DWR 2022c)
- *2022 Flood System Status Report (2022 FSSR)* (DWR 2022d)

This white paper also references other USJR-specific documents not included in the 2022 CVFPP Update document package, including the following:

- *Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System* (Inspection Report) (DWR 2022e)
- *2017 Flood System Long-Term Operations, Maintenance, Repair, Rehabilitation, and Replacement Cost Evaluation Technical Memorandum (OMRR&R TM)* (DWR 2017a)
- *USJR Regional Flood Management Plan (USJR RFMP)* (San Joaquin River Flood Control Project Agency [SJRFCA] 2015)

Several key themes for the USJR region emerge throughout these documents and are focused on flood management issues and regional priorities. The key themes include an overall need for investment in the flood system, flood system issues such as seepage, subsidence, and decreased channel capacity, and regional challenges to obtaining sustainable and reliable funding.

Contents

- Introduction 1
- 2022 Central Valley Flood Protection Plan Update and Supporting Documents 2
 - 2022 Central Valley Flood Protection Plan Update 2
 - 2022 Conservation Strategy Update..... 5
 - 2022 State Plan of Flood Control Descriptive Document 6
 - 2022 Flood System Status Report..... 9
- Other Relevant Documents 13
 - DWR Inspection Report 13
 - 2017 Flood System Long-Term Operations, Maintenance, Repair, Rehabilitation, and Replacement Cost Evaluation Technical Memorandum..... 13
 - 2015 USJR Regional Flood Management Plan 13
- References..... 14

Tables

- Table 1. USJR-Relevant Content in the 2022 CVFPP Update 3
- Table 2. USJR-Relevant Content in the 2022 Conservation Strategy Update 5
- Table 3. USJR-Relevant Content in the 2022 State Plan of Flood Control Descriptive Document 7
- Table 4. USJR-Relevant Content in the 2022 Flood System Status Report 10

Figures

- Figure 1. USJR Region Overview Map 1

Acronyms and Abbreviations

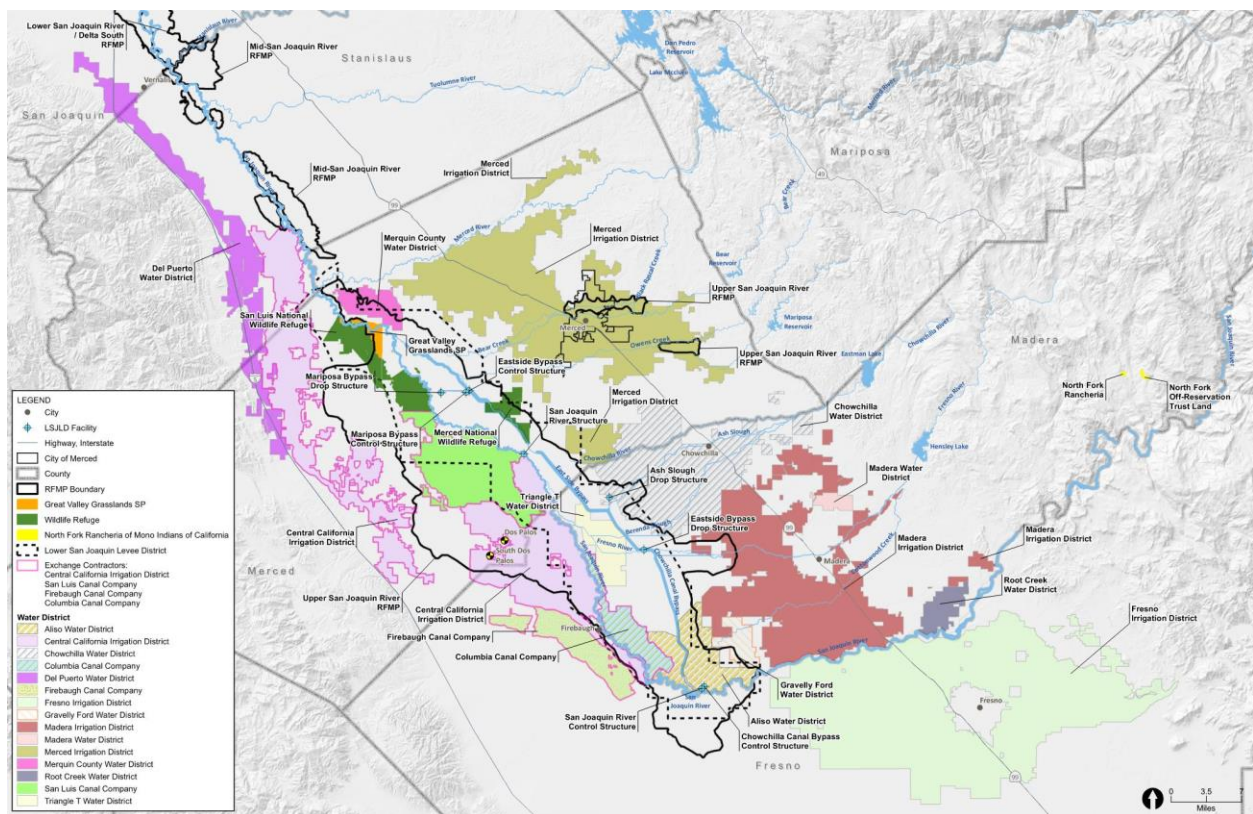
CPA	Conservation Planning Area
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CWC	California Water Code
CWC	California Water Code
DD	Descriptive Document
Delta	Sacramento–San Joaquin River Delta
DWR	Department of Water Resources
DWR	California Department of Water Resources
FCA	Flood Control Act
FCA	Flood Control Act
FEMA	Federal Emergency Management Agency
Flood-MAR	flood-managed aquifer recharge
FSRP	Flood System Repair Project
FSSR	Flood System Status Report
HD	House Document
Inspection Report	<i>Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System</i>
LMA	Local maintaining agencies
LMA	local maintaining agency
NULE	Non-Urban Levee Evaluation
NULE	Non-Urban Levee Evaluations Project
O&M	Operations and maintenance
O&M	operations and maintenance
OMRR&R	operations, maintenance, repair, rehabilitation, and replacement
RFMP	Regional flood management planning

RFMP	Regional Flood Management Plan, Regional Flood Management Planning
SD	Senate Document
SJRFCPA	San Joaquin River Flood Control Project Agency
SJRRP	San Joaquin River Restoration Program
SPFC	State Plan of Flood Control
SSIA	State Systemwide Investment Approach
TM	technical memorandum
ULE	Urban Levee Evaluations Project
USACE	US Army Corps of Engineers
USJR	Upper San Joaquin River

Introduction

For this white paper, each document in the package is briefly introduced, key takeaways relevant to the USJR region are discussed, and detailed information relevant to the USJR region is noted. Figure 1 displays an overview of the region and features included in the USJR region. The 2022 CVFPP Update document package includes the 2022 CVFPP Update and a series of supporting documents. The USJR region participated in the development of the 2022 CVFPP Update through DWR’s RFMP program. Participation included submittal of regional projects and operations and maintenance (O&M) cost data, a priorities white paper, and various reviews and feedback on plan-related content.

Figure 1. USJR Region Overview Map



The other USJR-specific documents not included in the 2022 CVFPP Update document package are also introduced with short summaries describing their relevance to the USJR region.

2022 Central Valley Flood Protection Plan Update and Supporting Documents

2022 Central Valley Flood Protection Plan Update

The 2022 CVFPP Update provides information pertinent to the USJR region that can be used to aid in a variety of flood planning activities. The CVFPP is California’s strategic blueprint for Central Valley flood risk management. It guides the State’s policies, investments, and partnerships and it ensures a climate-driven technical foundation for a flood management system that helps protect our communities, contributes to native species recovery, and integrates fully into broader water management conversations. The Central Valley Flood Protection Act of 2008 requires DWR to develop and update, and for the Central Valley Flood Protection Board (CVFPB) to adopt, the CVFPP on a 5-year cycle.¹

The 2022 CVFPP Update themes include the following:

- Flood system climate resiliency
- Accountability and adaptation through performance tracking
- Strategic alignment with other State water management planning efforts

Additionally, the 2022 CVFPP Update (DWR 2022a) highlights flood management equity as a current challenge and identifies the needs for new partnerships between the State and vulnerable communities to ensure future flood management strategies promote equity across all Central Valley communities.

The 2022 CVFPP Update included a new regional spotlights section that highlighted the six RFMP regions. The USJR regional spotlight, which the region helped to develop via the 2021 *USJR Regional Priorities White Paper* (SJRFCA 2021), focused on accomplishments, challenges, and priorities of the region. Table 1 summarizes the accomplishments, challenges, and priorities presented in the 2022 CVFPP Update’s USJR regional spotlight. Additionally, the 2022 CVFPP Update provided project spotlights for the Merced Flood-Managed Aquifer Recharge (Flood-MAR) Reconnaissance Study, Black Rascal Creek Flood Control Project, and the Regional Flood Management Strategy for the San Joaquin River Basin.

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¹ <https://cvfpb.ca.gov/cvfpp/>

Table 1. USJR-Relevant Content in the 2022 CVFPP Update

Item	Title	Description	Document Location
Section 2.4.2	Project Spotlight: Merced Flood-MAR Reconnaissance Study	DWR, in partnership with the Merced Irrigation District, is studying the climate change vulnerability and use of floodwaters for managed aquifer recharge that can support climate change adaptation and reduce flood risk, increase supply reliability, support groundwater sustainability, and enhance ecosystems in the Merced River Basin. The Merced study is exploring the potential feasibility and effectiveness of Flood-MAR concepts, testing theories, and describing strategies in overcoming challenges to project planning and implementation at a watershed scale.	Page 2-31
Figure 2.6	Reservoir Storage Capacities and Estimated Unregulated Runoff for 3-Day Storm Events	Shows unregulated runoff for the USJR and Merced River based on 1% flood event, 0.5% flood event, and 0.5% flood event with climate change.	Page 2-33
Section 2.9.4	Other Programs	The San Joaquin River Restoration Program (SJRRP) is a long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River to restore and maintain a self-sustaining Chinook salmon (<i>Oncorhynchus tshawytscha</i>) population and reduce or avoid adverse water supply impacts to Central Valley Project Friant Division long-term contractors. The project footprint for the SJRRP spans portions of the Mid and Upper San Joaquin regions and includes proposed modifications to several SPFC facilities. The flood bypass system is used to convey SJRRP restoration flows resulting in increased operations and maintenance costs to attempt to manage vegetation growth in a wet environment. SJRRP-proposed modifications along the bypass pose many challenges, but if implemented in coordination with local maintaining agencies could provide flood risk reduction benefits and new floodplain and related riparian habitat.	Page 2-64
Regional Overview	USJR Region	The USJR regional overview details accomplishments since the 2017 CVFPP Update (DWR 2017b), current regional challenges, and regional priorities. This section was informed by the <i>USJR Regional Priorities White Paper</i> (SJRFCA 2021).	Pages R-2 through R-3
Section 3.3.1.2	Systemwide Management Actions for San Joaquin River Basin	Shows actions by geographic location within the State Systemwide Investment Approach (SSIA) portfolio in Figure 3-5, a pie chart of action categories in Figure 3-6, a project spotlight for the Regional Flood Management Strategy for the San Joaquin River Basin, and a map that shows priority actions identified in a Spring 2021 workshop.	Pages 3-18 through 3-21
Section 3.3.1.2	Project Spotlight: Regional Flood Management Strategy for the San Joaquin River Basin	Priority actions identified in the Spring 2021 workshop include: <ul style="list-style-type: none"> • An evaluation of reservoir storage and reoperation • A 200-year level of protection in the Merced area • Exploring transitory storage opportunities and evaluating subsidence impacts of flood facilities near Mariposa Bypass • Protecting small communities such as Firebaugh • Seeking opportunities for a groundwater bank, transitory storage, floodplain restoration, and recharge 	Pages 3-20 through 3-21
Section 3.3.2.2	Urban Management Actions for San Joaquin River Basin	The only urban actions for the USJR region are in the Merced area. Planned and ongoing actions include: <ul style="list-style-type: none"> • Design and construction of the Black Rascal Creek Flood Control Project that contributes to 200-year level of protection to the City of Merced. • Continued support of the Merced County Streams Group effort to identify full 200-year level of protection and storage actions to provide the City of Merced with protection from flooding. This support may include reinitiating the Merced County Streams General Reevaluation Report to seek federal participation. 	Pages 3-24 through 3-26
Section 3.3.3	Rural Management Actions	Shows the need for repair and rehabilitation of USJR region hydraulic structures, levee repairs, and flowage easements to address San Joaquin River Basin subsidence. Shows actions by geographic location within the SSIA portfolio in Figure 3-13, and a pie chart of action categories in Figure 3-14.	Pages 3-26 through 3-29

Item	Title	Description	Document Location
Section 3.3.4	Small Community Management Actions	Shows actions by geographic location within the SSIA portfolio in Figure 3-18, a pie chart of action categories in Figure 3-18, and a project spotlight for the Black Rascal Creek Flood Control Project.	Pages 3-29 through 3-33
Section 3.3.4	Project Spotlight: Black Rascal Creek Flood Control Project	Provides a site plan and project background. The Black Rascal Creek Flood Control Project is a multi-benefit project that contributes to many CVFPP goals. This project is in Merced County within the Black Rascal Creek watershed east of the City of Merced.	Page 3-30

Source: DWR 2022a

2022 Conservation Strategy Update

As one of the five Conservation Planning Areas (CPAS) defined in the 2022 Conservation Strategy Update, the USJR region can utilize many important details regarding species conservation specific to the region are included in this document. The *2022 Conservation Strategy Update* (DWR 2022b) is a primary component to the CVFPP, focusing on improving ecosystem quality, quantity, function, and sustainability within the Systemwide Planning Area. The *2022 Conservation Strategy Update* provides actionable and measurable targets to improve riverine, aquatic, wetland and riparian habitat in the flood system through the integration of ecological principles with flood risk reduction projects, O&M activities, institutional support, and other means.

Five CPAs are outlined in the *2022 Conservation Strategy Update*, one of which is the USJR CPA which includes the San Joaquin River and tributaries from the Friant Dam to the Merced River (that is, the USJR region). Priorities in the USJR region include fish passage barriers, flow restoration in the San Joaquin River, aquifer recharge, and adaptations for climate change. Information in the 2022 Conservation Strategy Update that is relevant to the USJR region is contained in Table 2.

Table 2. USJR-Relevant Content in the 2022 Conservation Strategy Update

Item	Title	Description	Document Location
Table 1-1	Target Species	Provides information on species, target habitats, and measurable objectives for plants, invertebrates, fish, reptiles and birds within the USJR region.	Pages 1-9 through 1-11
Table 1-3	Measurable Objectives by Conservation Planning Area	For each Conservation Strategy Goal, gives a targeted ecosystem process, habitat, or stressor and metrics.	Pages A-13 through A-20
Table A-1	USJR Region Species Potentially Affected by the CVFPP	Certain species have their regional distribution in USJR and are considered to have a major potential CVFPP effect indicating that the implementation of the CVFPP (flood management and conservation actions) could substantially affect California populations of this species, based on distribution, habitat associations, and ecology of species; effects may be adverse or beneficial. Target Species Chosen for Focused Conservation Planning are listed in Table 1-1.	Pages A-13 through A-20

Source: DWR 2022b

2022 State Plan of Flood Control Descriptive Document

The 2022 SPFC DD (DWR 2022c) provides information about SPFC project facilities, lands, O&M, conditions, and programs and plans. The 2022 SPFC DD also addresses ongoing projects that may become part of the SPFC after their completion. The 2022 SPFC DD included greater detail than the prior 2017 SPFC DD Update, which was prepared in a condensed format (DWR 2017c), and aligns with the level of detail of the 2010 SPFC DD (DWR 2010).

The San Joaquin River Watershed is one of the primary focus areas of the 2022 SPFC DD and is discussed throughout this white paper in connection to topics like ongoing joint State-federal management projects, facilities, and observations. Information found in the 2022 SPFC DD regarding the San Joaquin Watershed and information useful to the USJR region is summarized in Table 3. Due to its classification as a descriptive document, the 2022 SPFC DD does not provide any formal recommendations but instead uses observations that can be used to “facilitate the presentation of SPFC materials.” One key observation highlighted in the 2022 SPFC DD that is important to the USJR region is a 2015 US Army Corps of Engineers (USACE) letter to the CVFPB that federally deauthorized the Lower San Joaquin River Flood Control Project (DWR 2022c).

Table 3. USJR-Relevant Content in the 2022 State Plan of Flood Control Descriptive Document

Item	Title	Description	Document Location
Figure 2-1	Approximate locations of Federal/State Flood Damage Reduction Projects within the Sacramento River and San Joaquin River Watersheds that are included in the SPFC	Shows the general location of 19 SPFC projects.	Page 2-5
Section 2.2.2.2	Buchanan Dam and Eastman Lake Project	The Buchanan Dam and Eastman Lake Project was authorized by the Flood Control Act (FCA) of 1962 (Public Law 87-874, 87th Congress) in accordance with recommendations by the USACE Chief of Engineers in Senate Document (SD) 98. California Water Code (CWC) Section 12648.4 provides State authorization for the project. The dam and reservoir are not part of the SPFC, but the channel improvements downstream from Buchanan Dam on the Chowchilla River and tributaries are included in the SPFC.	Page 2-13
Section 2.2.2.3	Hidden Dam and Hensley Lake Project	The Hidden Dam and Hensley Lake Project was authorized by the FCA of 1962 (Public Law 87-874, 87th Congress), substantially in accordance with recommendations by the USACE Chief of Engineers in SD 37 (87th Congress). CWC Section 12648.3 provides State authorization for the project. The dam and reservoir are not part of the SPFC, but the channel improvements downstream from Hidden Dam on the Fresno River are included in the SPFC.	Page 2-13
Section 2.2.2.4	Merced County Streams Project	The improvement of the Merced County Streams was authorized by the FCA of 1944 (Public Law 78-534, 78th Congress). The authorization was based on House Document (HD 473) (78th Congress). CWC Section 12650 provides State authorization for the project. The project includes a diversion from Black Rascal Creek to Bear Creek, a diversion between Owens Creek and Mariposa Creek, channel improvements and levees, and one retarding-type reservoir east of the City of Merced. The project reduces flood risk to agricultural areas, the City of Merced, and the towns of Planada and Le Grand and other smaller communities. Of the five authorized and constructed reservoirs, the State provided assurances to the federal government for only one reservoir, Castle Dam, authorized by the FCA of 1970 (Public Law 91-611, Section 201, Statute 1824).	Page 2-13
Table 2-3	Summary of Ongoing State-federal Flood Protection Projects	Provides a list of ongoing State-federal flood protection projects.	Pages 2-17 through 2-18
Figure 2-2	Locations of Multipurpose (including Flood Control) Dams and Reservoirs in the Sacramento River and San Joaquin River Watersheds	Shows dams and reservoirs sorted by agency ownership.	Page 2-23
Figure 2-3	Location of Designated Floodways within the Sacramento River and San Joaquin River Watersheds	Shows CVFPB-designated floodways.	Page 2-26
Figure 3-2	Design Flood Flow Capacities within the San Joaquin River, Bypasses, and Major Tributaries and Distributaries in the San Joaquin River Watershed	Shows SPFC levees and flood channel design capacities in cubic feet per second.	Page 3-17
Figure 3-10	Index Map of the San Joaquin River Watershed including the Two Major Watersheds with Facilities of the State Plan of Flood Control	Shows the SPFC facilities.	Page 3-66
Figure 3-11A/B	Chowchilla and Eastside Bypasses – State Plan of Flood Control Facilities along the Chowchilla and Eastside Bypasses and Tributaries	Shows the SPFC facilities.	Pages 3-71 through 3-72
Figure 3-12A/C	San Joaquin River Watershed – State Plan of Flood Control Facilities along the San Joaquin and Tributaries	Shows the SPFC facilities.	Pages 3-78 through 3-80

Item	Title	Description	Document Location
Table 3-4	State Plan of Flood Control Structures in the San Joaquin River Watershed	Shows structures maintained by the Lower San Joaquin Levee District, including: Ash Slough Drop Structures No. 1, 2, 3, and 4, Eastside Bypass Control Structure, Eastside Bypass Drop Structures No. 1 and 2, Fresno River Diversion Weir, Fresno River Drainage Structure, Mariposa Bypass Control Structure, Mariposa Bypass Drop Structure, Owens Creek Control Structure, San Joaquin River Control Structure, San Joaquin River Structure, Sand Slough Structure. Structures maintained by the Merced County Streams Group are also listed including the Black Rascal Creek Drop Structure and Owens Creek Diversion Channel Siphon.	Pages 3-84 through 3-85
Figure 5-2B	Locations of Maintaining Agencies within the San Joaquin River Watershed	Shows the Lower San Joaquin River Levee District, Merced Streams Group, and Madera County Flood Control & Water Conservation Agency.	Page 5-15
Section 7.2	State Oversight and Management of State Plan of Flood Control	Provides information on how CVFPB, DWR, the California Department of Fish and Wildlife, and other assisting State agencies support CVFPB and DWR in their management and oversight of the SPFC.	Page 7-2
Section 7.3	Federal Oversight and Management of State Plan of Flood Control	Provides information about how USACE, the Federal Emergency Management Agency (FEMA), the National Weather Service, and other assisting federal agencies support CVFPB and DWR in their management and oversight of the SPFC.	Pages 7-4 through 7-6
Section 9.2	Lower San Joaquin River Flood Control Project	USACE Sacramento District stated to CVFPB, by letter dated July 23, 2015, that in its view, the levees, and channels of the San Joaquin River system upstream of the Merced River have not been congressionally authorized and, therefore, are not federal flood risk reduction structures.	Pages 9-2 through 9-3
Figure A-16, Detail 15	Mariposa Bypass to San Joaquin River at River Mile to 95	Show facilities (SPFC and non-SPFC) in the USJR region.	Page A-18
Figure A-17, Detail 16	Fresno River to Mariposa Slough	Show facilities (SPFC and non-SPFC) in the USJR region.	Page A-19
Figure A-18, Detail 17	San Joaquin River at Chowchilla Canal Bypass Control Structure to San Joaquin River Structure	Show facilities (SPFC and non-SPFC) in the USJR region.	Page A-20
Figure A-19, Detail 18	Chowchilla Canal Bypass Control Structure to Fresno River Drainage Structure	Show facilities (SPFC and non-SPFC) in the USJR region.	Page A-21

Source: DWR 2022c

2022 Flood System Status Report

DWR prepared the 2022 FSSR (DWR 2022d) to meet the legislative requirements of CWC Section 9120 and the Central Valley Flood Protection Act of 2008, and to contribute to CVFPP development. The 2022 FSSR is comprised of tables and figures describing current flood system conditions and provides performance tracking information for SPFC facilities across the state. The 2022 FSSR supports the monitoring and tracking of metrics related to the performance of the CVFPP over time to help guide future inspection, evaluation, reconstruction, and improvement to SPFC facilities.

All State-federal project facilities in the San Joaquin River Watershed are part of the SPFC. SPFC facilities include project levees, channels, and associated flood control structures in the watershed. Many of the non-urban levees in the USJR region are classified as higher-concern with issues including underseepage, through-seepage, and encroachment issues as summarized in Table 4 (DWR 2022d).

Table 4. USJR-Relevant Content in the 2022 Flood System Status Report

Item	Title	Description	Document Location
Figure ES-2	Physical Levee Conditions Based on ULE and NULE Results in the San Joaquin River Watershed	Show levees of higher and lower concern.	Pages xii through xiv
Figure 2-2	PL 84-99 Status of SPFC Levees in San Joaquin River Watershed	Shows active, inactive, and not enrolled levees.	Page 2-11
Figure 3-2	FEMA Floodplains with Annual 0.2-percent Chance of Flooding in the San Joaquin River Watershed	Shows that most of the USJR region is within the annual 0.2-percent chance of flooding floodplain.	Page 3-4
Figure 3-7	South NULE Study Area Overall Hazard Classifications in the San Joaquin River Watershed	Does not show any Non-Urban Levee Evaluation Project (NULE) Overall Hazard Classifications in the USJR region that have “improved” since the 2017 FSSR (DWR 2017d). There are some sites that were “not assessed.”	Page 3-22
Figure 4-4	NULE Levee Geometry Check in the San Joaquin River Watershed	Shows geometry criteria (that is, where the levee geometry meets or does not meet those criteria) in the USJR region.	Page 4-14
Figure 4-7	NULE Freeboard Check Results in the San Joaquin River Watershed	Shows all the USJR region as “not assessed.”	Page 4-21
Figure 4-10	NULE Underseepage Hazard Classifications in the San Joaquin River Watershed	In the USJR region, shows the majority of both SPFC and non-SPFC levees not meeting criteria.	Page 4-31
Figure 4-13	NULE Through-seepage Hazard Classifications in the San Joaquin River Watershed	In the USJR region, shows half of the SPFC levees meeting criteria and all non-SPFC levees meeting criteria.	Page 4-34
Figure 4-16	NULE Landside Slope Stability Hazard Classifications in the San Joaquin River Watershed	In the USJR region, shows most levees meeting criteria, with a few points not assessed.	Page 4-42
Figure 4-18	2020 Slope Stability Inspection Ratings in the San Joaquin River Watershed	In the USJR region, shows most levees meeting criteria. There were not many inspections shown.	Page 4-45
Figure 4-21	NULE Erosion Hazard Classifications in the San Joaquin River Watershed	In the USJR region, shows most levees meeting criteria. Some were not assessed.	Page 4-53
Figure 4-23	2020 Erosion Inspection Ratings in the San Joaquin River Watershed	In the USJR region, shows about half of levees meeting criteria. There were not many inspections shown.	Page 4-58
Figure 4-25	2020 Crown Surface, Depressions, and Rutting Inspection Ratings in the San Joaquin River Watershed	In the USJR region, shows all levees meet criteria.	Page 4-63
Figure 4-27	Levee Penetrations in the San Joaquin River Watershed	In the USJR region, shows many levee penetration sites, especially around the Mariposa Bypass and Bear Creek area.	Page 4-67
Figure 4-29	2020 Levee Vegetation Inspection Ratings in the San Joaquin River Watershed	In the USJR region, shows most levees meeting criteria.	Page 4-79
Figure 4-31	2020 Trimming or Thinning Trees Inspection Ratings in the San Joaquin River Watershed	In the USJR region, shows most levees meeting criteria.	Page 4-81
Figure 4-33	Animal Burrow Hole Persistence in the San Joaquin River Watershed	In the USJR region, shows most levees having a high animal burrow hole persistence rating.	Page 4-33

Item	Title	Description	Document Location
Figure 4-35	2020 Animal Control Inspection Ratings in the San Joaquin River Watershed	In the USJR region, shows most levees meeting criteria.	Page 4-90
Figure 4-37	2020 Encroachment Inspection Ratings in the San Joaquin River Watershed (Maintenance Issue Type)	In the USJR region, shows most levees meeting criteria. Maintenance issues include pruning and material piles, fences, and signs among many types of encroachments.	Page 4-95
Figure 4-39	2020 Encroachment Inspection Ratings in the San Joaquin River Watershed (Enforcement Issue Type)	In the USJR region, shows approximately half of levees meeting criteria. These issues include privately owned, unpermitted encroachments that threaten levee integrity, are inappropriately placed on the levee, or obstruct visibility and access during flood-fighting efforts. These can include buildings, boat docks, fences, material piles, and equipment, among many types of encroachments.	Page 4-97
Figure 5-4	Channel Capacity Status in the San Joaquin River Watershed	In the USJR region, shows channel capacity status, including sufficient capacity, freeboard encroachment, insufficient capacity, and undefined.	Page 5-9
Table 6-7	Hydraulic Structure Inspection Results in the San Joaquin River Watershed	Shows ratings for three local maintaining agencies (LMAs) in USJR region: Lower San Joaquin Levee District, Merced Streams Group, and Madera County Flood Control and Water Conservation Agency.	Page 6-10
Table 8-4	Higher-concern Non-urban SPFC Levees in the San Joaquin River Watershed	Shows higher-concern levees based on Tables 8-4A Levees, 8-4B Channels, and 8-4C Structures. Includes NA0010 Units 17 and 18 within the Chowchilla Canal Bypass, Unit 6 in the East Side Bypass, and Units 1, 2a, 2b, 5, 23, and 24 in the San Joaquin River. Lower San Joaquin Levee District is the LMA for each of these reaches.	Page 8-8
Figure A-2	Historical Levee Breaches in the San Joaquin River Watershed	For the USJR region, shows some breaches, though none in the Eastside Bypass or Chowchilla Bypass. Refer to Table A-7 for tabular results.	Page A-5
Figure A-4	Historical Levee Overtopping in the San Joaquin River Watershed	For the USJR region, shows some overtopping in the Eastside Bypass downstream of the Chowchilla River. Refer to Table A-9 for tabular results.	Page A-7
Figure A-7	Levee Raises, Levee Widening, and Levee Reconstructions in the San Joaquin River Watershed	Around the Sacramento–San Joaquin River Delta (Delta) and Stockton area, shows some SPFC levee raises and widening, as well as levee reconstruction. However, for the USJR region, there are none.	Page A-16
Figure A-9	Historical Seepage Occurrences in the San Joaquin River Watershed	For the USJR region, shows boils and seepage sites in most areas. Refer to Table A-9 for tabular results.	Page A-19
Figure A-11	Seepage Remediation in the San Joaquin River Watershed	For USJR region, shows berms (mostly in the Chowchilla Bypass), seepage ditches (along the San Joaquin River), and slurry cut-off walls (along the Eastside Bypass).	Page A-21
Figure A-15	Historical Slope Instability Occurrences in the San Joaquin River Watershed	For the USJR region, shows most of the area having historical slope instability sites.	Page A-28
Figure A-17	Historical Erosion Occurrences in the San Joaquin River Watershed	For the USJR region, shows most of the area having historical erosion occurrences.	Page A-31
Figure A-19	Levee Erosion Repair Sites in the San Joaquin River Watershed	For the USJR region, shows some revetment/riprap sites before 2017. There are no Flood System Repair Project (FSRP) sites for levee erosion in the USJR region. For more information on FSRP, refer to Section A.3.4.1.	Page A-33
Figure A-21	Historical Sinkholes and Subsidence Distresses in the San Joaquin River Watershed	Shows subsidence distresses along the Eastside Bypass, and some sinkholes along the Chowchilla Bypass.	Page A-37

Item	Title	Description	Document Location
Table A-5	Tabular San Joaquin River Basin Non-urban Levee Evaluation results from Chapter 4	Combines tabular results, with specifics by LMA. Refer to Figures 4-4, 4-7, 4-10, 4-13, 4-16, and 4-18 for geographic results.	PDF Page 361
Table A-7	Historical Breach Sites in the San Joaquin River Basin	Combines tabular results, with specifics by LMA Short Name (NA0010 for Lower San Joaquin Levee District). Refer to Figure A-2 for geographic results.	PDF Page 373
Table A-9	Historical Overtopping Sites in the San Joaquin River Basin	Combines tabular results, with specifics by LMA Short Name. Refer to Figure A-4 for geographic results.	PDF Page 379
Table A-11	Historical Seepage Sites in the San Joaquin River Basin	Combines tabular results, with specifics by LMA Short Name. Refer to Figure A-9 for geographic results.	PDF Page 403
Table A-15	Historical Instability Sites in the San Joaquin River Basin	Combines tabular results, with specifics by LMA Short Name. Refer to Figure A-15 for geographic results.	PDF Page 463
Table A-17	Historical Erosion Sites in the San Joaquin River Basin	Combines tabular results, with specifics by LMA Short Name. Refer to Figure A-17 for geographic results.	PDF Page 527
Table A-19	Historical Subsidence Sites in the San Joaquin River Basin	Combines tabular results, with specifics by LMA Short Name. Refer to Figure A-21 for geographic results.	PDF Page 549
Table A-22	Animal Burrow Persistence Study – Local Maintaining Agency Levee Miles Classified by Number of Reported Incidents in the San Joaquin River Watershed	Combines tabular results, with specifics by LMA Short Name. Refer to Figure 4-33 for geographic results.	PDF Page 563
Table A-23	USACE Periodic Inspection and Routine Inspection Ratings by LMA	Combines tabular results, with specifics by LMA Short Name. Refer to https://cdec.water.ca.gov/lma_maps.html for geographic locations of unit numbers.	PDF Page 567
Table B-2	San Joaquin River Watershed Channel Capacity Status	Shows San Joaquin River Watershed channel capacity information. Refer to Figures B-19, B-20, B-21, and B-22 for geographic results.	Page B-7
Figure B-18	San Joaquin Watershed Index	Shows an index map of reaches by watershed. For USJR region, matches with Figures B-19, B-20, B-21, and B-22.	Page B-40
Figure B-19	Upper San Joaquin River Capacity Reach Map	Shows channel status by geographic area, backwater influence, freeboard encroachment, and insufficient capacity. More information can be found in Table B-2.	Page B-41
Figure B-20	Eastside Bypass and Chowchilla Bypass Capacity Reach Map	Shows channel status by geographic area, backwater influence, freeboard encroachment, and insufficient capacity. More information can be found in Table B-2.	Page B-42
Figure B-21	Ash Slough, Berenda Slough, and Fresno River Capacity Reach Map	Shows channel status by geographic area, backwater influence, freeboard encroachment, and insufficient capacity. More information can be found in Table B-2.	Page B-43

Source: DWR 2022d

Other Relevant Documents

DWR Inspection Report

Every year, DWR inspects levees in the State-federal portions of the flood management system in the Central Valley and publishes an inspection report documenting inspection efforts titled *Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System* (DWR 2022e). The San Joaquin River Flood Control System is an important system highlighted throughout the document that provides information regarding the USJR region ranging from guidance and inspection rating to flood control structures to an erosion survey. This inspection report includes the following components:

- Levee maintenance inspection results
- Channel maintenance inspection results
- Structure maintenance inspection results
- San Joaquin River flood control system erosion survey
- LMA reporting requirements
- Designated floodways inspections
- Utility crossing inspection
- Flood project inspection and assessment section activities and accomplishments

2017 Flood System Long-Term Operations, Maintenance, Repair, Rehabilitation, and Replacement Cost Evaluation Technical Memorandum

The 2017 OMRR&R TM (DWR 2017a) was developed by DWR, the CVFPB, RFMP regions, other regional experts and work groups, and LMA staff as a part of the 2017 CVFPP Update (DWR 2017b). The OMRR&R TM supports the realistic estimation of the full cost of OMRR&R of current SPFC facilities in the Central Valley. This includes information specific to the San Joaquin River Basin and specific to both urban and non-urban areas in USJR region. OMRR&R activities include levee maintenance, channel maintenance, major and minor structure maintenance, as well as information regarding potential funding sources and recommendations. The San Joaquin River Basin-Wide Feasibility Studies Planning Area is one of the main focus areas of the OMRR&R TM.

2015 USJR Regional Flood Management Plan

Also developed in support of the 2017 CVFPP Update effort, the 2015 USJR RFMP (SJRFCA 2015) identified regional flood management issues, needed system improvements, and evaluated opportunities for developing potential multi-benefit projects. The 2015 USJR RFMP

identifies a series of structural and nonstructural system improvements that address a range of critical flood-related problems. This includes the development of a regional finance plan as well as recommendations and suggestions for future project implementation.

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