RECLAMATION DISTRICT NO. 773
MEETING AGENDA FOR
BOARD OF TRUSTEES
9:00 A.M. APRIL 4, 2023

3121 WEST MARCH LANE, SUITE 100
STOCKTON, CA

AGENDA

1. Call to Order/Roll Call.
2. Public comment: Under Government Code section 54954.3, members of the public may address the Board on any issue in the District's jurisdiction. The public may address any item on the agenda at the time it is taken up.
3. Minutes. Consider for approval minutes of the February 7, 2023, Board meeting.
4. District Financial Report.
5. District Budget. Discussion and possible action to amend 2022-2023 District Budget.
6. Audit. Review and Accept Draft Audit Report and Representation Letter for Fiscal Year ending June 30, 2022.
7. Engineers' Report. Discussion and possible action.
   a. Review status of levee repairs associated with 2022/2023 high water event.
   b. Ratify contract for placement of screened aggregate material to repair rills in the District's levee.
   c. Review outcome of Paradise Cut Expansion & South Delta Restoration Project Public Workshop held on March 23, 2023.
8. Subventions. Adopt Resolution 2023-02 Approving and Authorizing Execution of Delta Levee Maintenance Subventions Program Work Agreements for Fiscal Year 2023-2024.
9. CEQA. Adopt Resolution 2023-03 Authorizing and Directing Filing of Notice of Exemption for Routine Maintenance for Fiscal Year 2023-2024.
10. Correspondence and meeting attendance reports.
11. District Calendar.
    a. June 6, 2023
12. Bills. Approval of bills to be paid.
13. Adjournment.

This agenda shall be made available upon request in alternative formats to persons with a disability, as required by the Americans with Disabilities Act of 1990 (42 U.S.C. § 12132) and the Ralph M. Brown Act (California Government Code §54954.2). Persons requesting a disability related modification or accommodation in order to participate in the meeting should contact Andy Pinasco at 209/948-8200 during regular business hours, at least twenty-four hours prior to the time of the meeting.

Materials related to an item on this Agenda submitted to the Trustees after distribution of the agenda packet are available for public inspection in the office of the District Secretary at Neumiller & Beardslee, 3121 West March Lane, Suite 100, Stockton, California during normal business hours.

AGENDA PACKET
RECLAMATION DISTRICT 773
APRIL 4, 2023

ITEM	COMMENTARY
1.	Self-explanatory.
2.	Self-explanatory.
3.	Please see attached.
4.	Please see attached.
5.	Please see attached.
6.	Please see attached.
7.	Please see attached.
8.	Please see attached.
9.	Please see attached.
10.	Self-explanatory.
11.	Please see attached.
12.	Please see attached.
13.	Self-explanatory.

ITEM 3

Minutes of Meeting of
Reclamation District 773
Held on February 7, 2023

The special meeting of the Board of Trustees of Reclamation District 773 was held at 9:00 a.m. on February 7, 2023, at the District's office located at 3121 West March Lane, Suite 100.

Item No. 1: The meeting was called to order at 9:00 a.m. Present were President Mark Bacchetti, Trustee Joe Enos, Trustee Ryan Bacchetti. Also present were Chris Neudeck, District Engineer, Andy Pinasco, District Secretary.

Item No. 2: Public Comment. None.

Item No. 3: Minutes. The minutes of the January 12, 2023, meeting were approved unanimously by the Trustees present on a motion by President Mark Bacchetti, seconded by Trustee Joe Enos.

Item No. 4: Mr. Pinasco provided a written financial report and reviewed it with the Trustees. The Trustees directed District staff to bring back an amended 22-23 Budget increasing Line Items L3 and L4. The financial report was accepted by unanimous vote of the Trustees present on a motion by President Mark Bacchetti, seconded by Trustee Ryan Bacchetti.

Item No. 5: Resolution 2023-01. Mr. Pinasco provided an oral report with support from District Engineer Mr. Neudeck to review the emergency situation. The report consisted of an update on damages resulting from the severe storms occurring in early January 2023. Mr. Neudeck recommended that the District continue monitoring the situation under the authority of Resolution 2023-01, as emergency conditions continue to exist due to flood risk and damage resulting from incoming severe storms. The Trustees unanimously determined that the emergency condition continues to exist due to flood risk and damage resulting from recent severe storms on a motion by Trustee Joe Enos, seconded by Trustee Ryan Bacchetti.

Item No. 6: Insurance. Mr. Pinasco provided an oral report regarding the District's insurance renewal. As of time of this meeting, the District's insurance broker, Dohrmann Insurance, has not provided a renewal quote. Mr. Pinasco recommended that the Trustees delegate the authority to renew the District's insurance to the Trustee President, and that the policy can be reviewed at the April meeting. The Trustees unanimously delegated authority to the Trustee President to approve the 2023-2024 District Insurance on a motion by Trustee Ryan Bacchetti, seconded by Trustee Joe Enos.

Item No. 7: Engineers' Report. Mr. Neudeck summarized the District Engineer's written and oral report. Mr. Neudeck's report summarized the Final Phase 5 Toe Berm Plans and reviewed the levee maintenance project for 2023. Mr. Neudeck also discussed

various emergency repair projects resulting from the recent severe storms and received direction from the Trustees to carry such work out under the emergency declaration declared in Resolution 2023-01.

The Trustees ratified the award of contract to AM Stephens Construction for work performed in response to the emergency situation on a motion by Trustee Joe Enos, seconded by Trustee Ryan Bacchetti.

Mr. Neudeck then reported on addendums to the AM Stephens Construction contract resulting from additional emergency repairs. The Trustees unanimously approved the addendums to the AM Stephens Construction contract in the amount of $25,000 on a motion by Trustee Ryan Bacchetti, seconded by Trustee Joe Enos.

Mr. Neudeck then provided short oral report regarding the Paradise Cut Expansion and South Delta Restoration Project to remind the Trustees that a group would be organizing a public meeting at the Roberts Island Farm Center and that District staff would provide the date/time to Trustees. District staff will be in attendance.

Item No. 8: There was no report on the correspondence in the agenda packet.

Item No. 9: Mr. Pinasco reviewed the District calendar with the Trustees pointing out that the next meeting was on April 4, 2023.

Item No. 9: Mr. Pinasco reported on the outstanding bills that had been received and the status of the District's accounts. On a motion by President Mark Bacchetti, seconded by Trustee Joe Enos, the Trustees present unanimously approved payment of the attached bills identified on the attached bills paid report.

Item No. 10: The meeting was adjourned at 9:58 a.m. by unanimous vote of the Trustees present on a motion by Trustee Joe Enos, seconded by President Mark Bacchetti.

Respectfully submitted,

_____

Andy Pinasco, District Secretary

ITEM 4

RECLAMATION DISTRICT 773
FINANCIAL REPORT FEBRUARY 2023 MEETING
67% OF 2022/2023 FISCAL YEAR THROUGH FEBRUARY 2023

	INCOME	Annual Budget Amount	Received Period TD	Received YTD	% YTD
	INTEREST	$ 2,000.00	$0.00	$ 2,227.00	111.35%
	ASSESSMENTS (MAX. ALLOWANCE)	$ 235,793.00	$94,023.09	$ 100,698.27	42.71%
	SUBVENTION REIMBURSEMENT	$ 100,000.00	$0.00	$ -	0.00%
	Total Income	**$ 337,793.00**	**$ 94,023.09**	**$ 102,925.27**	**30.47%**
	EXPENSES	**Annual Budget Amount**	**Expended Period TD**	**Expended YTD**	**% YTD**
	GENERAL				
G1	County Assessment Administration	$ 2,000.00	$153.00	$ 1,955.22	97.76%
G2	Miscellaneous Supplies	$ 300.00	$0.00	$ -	0.00%
G3	General Engineering	$ 25,000.00	$1,679.44	$ 9,866.06	39.46%
G4	Legal and Accounting	$ 25,000.00	$1,829.73	$ 8,811.46	35.25%
G5	Insurance	$ 15,000.00	$100.00	$ 10,825.25	72.17%
G6	Contingency	$ 4,000.00	$0.00	$ 2,868.00	71.70%
	Account Funding Placeholder		$0.00		
	Total General Expenses	**$ 71,300.00**	**$ 3,762.17**	**$ 34,325.99**	**48.14%**
	LEVEE WORK				
L1	Vegetation Control and Management	$ 45,000.00	$822.50	$ 9,136.25	20.30%
L2	Rodent Control	$ 30,000.00	$26,893.11	$ 26,983.11	89.94%
L3	Construct All-Weather Road Surfacing	$ 15,000.00	$0.00	$ -	0.00%
L4	Waterside Erosion Repair	$ 25,000.00	$0.00	$ 1,007.50	4.03%
L5	Back Slope Fill Flattening	$ 250,000.00	$9,803.75	$ 175,658.87	70.26%
L6	General Levee Maintenance	$ 50,000.00	$2,275.07	$ 9,559.09	19.12%
L7	DWR 5 Year Plan	$ -	$45.00	$ 45.00	0.00%
	Total Levee Work	**$ 415,000.00**	**$ 39,839.43**	**$ 222,389.82**	**53.59%**
	Total Expenses	**$ 486,300.00**	**$ 43,601.60**	**$ 256,715.81**	**52.79%**

	ANNUAL BUDGET AMOUNT	PTD INCOME/LOSS	YTD INCOME/LOSS	
NET INCOME (LOSS)	**$ (148,507.00)**	**$50,421.49**	**$ (153,790.54)**	

Fund Balance as of Beginning of Fiscal Year 2022-2023	$	559,452.67
Revenues (YTD)	$	102,925.27
Expenses (YTD)	$	256,715.81
Total Cash in General Fund	**$**	**405,662.13**
Total Restricted Cash in 5 Year Plan Account	**$**	**2,636.01**
Bank of Stockton	**$**	**31,238.30**
Total Available Cash	**$**	**436,900.43**

ITEM 5

RECLAMATION DISTRICT 773
FINAL BUDGET FOR FISCAL YEAR 2022-2023

	EXPENSES	2022-2023 Budget	Proposed Amendment to 2022-2023 Budget
	GENERAL		
G1	County Assessment Administration	$ 2,000.00	
G2	Miscellaneous Supplies	$ 300.00	
G3	General Engineering	$ 25,000.00	
G4	Legal and Accounting	$ 25,000.00	
G5	Insurance	$ 15,000.00	
G6	Contingency	$ 4,000.00	
G7	Emergency Equipment & Supplies	$ -	
	Totals	**$ 71,300.00**	
	LEVEE WORK		
L1	Vegetation Control and Management	$ 45,000.00	
L2	Rodent Control	$ 30,000.00	
L3	Construct All-Weather Road Surfacing	$ 15,000.00	
L4	Waterside Erosion Repair	$ 25,000.00	**$ 185,000.00**
L5	Back Slope Fill Flattening	$ 25,000.00	
L6	General Levee Maintenance	$ 50,000.00	
L7	DWR 5 Year Plan	$ -	
	Totals	**$ 190,000.00**	**$ 375,000.00**
	Total Expense Budget	**$ 261,300.00**	**$ 446,300.00**
	INCOME		
	Interest	$ 2,000.00	
	Assessment (Max. Allowance)	$ 235,793.00	
	Subventions Reimbursement	$ 265,000.00	
	DWR 5 Year Plan Reimbursement	$ -	
	Delta Grant II - Emergency Supplies	$ -	
	Total Income Budget	**$ 502,793.00**	**$ 502,793.00**
	NET INCOME (LOSS)	**$ 241,493.00**	**$ 56,493.00**

ITEM 6

73673-34248

CROCE, SANGUINETTI, & VANDER VEEN INC
CERTIFIED PUBLIC ACCOUNTANTS

February 7, 2023

Andrew Pinasco, Attorney at Law
Neumiller & Beardslee
Post Office Box 20
Stockton, California 95201-3020

Dear Mr. Pinasco:

We enclose five copies of the financial statements and independent auditor's report for **Reclamation District No. 773** for the year ended June 30, 2022. In addition, we enclose our report *Communication with Those Charged with Governance*.

An electronic copy of the financial statements and independent auditor's report has been emailed to the California State Controller's Office at SDsupport@sco.ca.gov and the San Joaquin County Auditor-Controller's Office at districtauditreports@sjgov.org.

If you should have any questions regarding the financial statements, please contact our office.

Yours very truly,

CROCE, SANGUINETTI, & VANDER VEEN, INC.
Certified Public Accountants

Pauline Sanguinetti

Pauline Sanguinetti
Certified Public Accountant

cml
Enclosures

3520 BROOKSIDE ROAD, SUITE 141 | STOCKTON, CA 95219 | (209) 938-1010 | (209) 594-1250 FAX | CSVCPAS.COM

CROCE, SANGUINETTI, & VANDER VEEN
CERTIFIED PUBLIC ACCOUNTANTS

February 7, 2023

Board of Trustees
Reclamation District No. 773
c/o Andrew Pinasco
Post Office Box 20
Stockton, California 95201

We have audited the financial statements of the governmental activities, each major fund, and the aggregate remaining fund information of **Reclamation District No. 773** for the year ended June 30, 2022. Professional standards require that we provide you with information about our responsibilities under generally accepted auditing standards as well as certain information related to the planned scope and timing of our audit. We have communicated such information to you. Professional standards also require that we communicate to you the following information related to our audit.

Significant Audit Findings

Qualitative Aspects of Accounting Practices

Management is responsible for the selection and use of appropriate accounting policies. The significant accounting policies used by **Reclamation District No. 773** are described in Note A to the financial statements. During the year ended June 30, 2022, the District implemented Government Accounting Standards Board (GASB Statement No. 92, *Omnibus 2020,* as discussed in Note A to the financial statements. The application of existing policies was not changed during the year ended June 30, 2022. We noted no transactions entered into by the District during the year for which there is a lack of authoritative guidance or consensus. All significant transactions have been recognized in the financial statements in the proper period.

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ significantly from those expected. The most sensitive estimates affecting the financial statements was:

- Management's estimates of the state assistance receivable in the amount of $204,612 as reported on the statement of net position as of June 30, 2022 is based on calculations and assessments by the District's engineers of the proceeds to be received for subvention eligible expenses for the fiscal year ended June 30, 2022.

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Certain financial statement disclosures are particularly sensitive because of their significance to the financial statement users. We did not identify any sensitive financial statement disclosures.

The financial statement disclosures are neutral, consistent, and clear.

Difficulties Encountered in Performing the Audit

We encountered no significant difficulties in dealing with management in performing and completing our audit.

Corrected and Uncorrected Misstatements

Professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that are clearly trivial, and communicate them to the appropriate level of management. We did not identify any material misstatements during the course of our audit.

Disagreements with Management

For purposes of this letter, a disagreement with management is a financial accounting, reporting, or auditing matter, whether or not resolved to our satisfaction, that could be significant to the financial statements or the auditor's report. We are pleased to report that no such disagreements arose during the course of our audit.

Management Representations

We have requested certain representations from management that are included in the management representation letter dated January 10, 2023.

Management Consultations with Other Independent Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters, similar to obtaining a "second opinion" on certain situations. If a consultation involves application of an accounting principle to the District's financial statements or a determination of the type of auditor's opinion that may be expressed on those statements, our professional standards require the consulting accountant to check with us to determine that the consultant has all the relevant facts. To our knowledge, there were no such consultations with other accountants.

Other Audit Findings or Issues

We generally discuss a variety of matters, including the application of accounting principles and auditing standards, with management each year prior to retention as the District's auditors. However, these discussions occurred in the normal course of our professional relationship and our responses were not a condition to our retention.

Other Matters

We applied certain limited procedures to the Statement of Revenues, Expenditures and Changes in Fund Balance - Budget and Actual - Governmental Funds, which is required supplementary information (RSI) that supplements the basic financial statements. Our procedures consisted of inquiries of management regarding the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We did not audit the RSI and do not express an opinion or provide any assurance on the RSI.

Restriction on Use

This information is intended solely for the use of the Board of Trustees and management of **Reclamation District No. 773** and is not intended to be and should not be used by anyone other than these specified parties.

Very truly yours,

Croce, Sanguinetti, & Vander Veen, Inc.

CROCE, SANGUINETTI, & VANDER VEEN, INC.
Certified Public Accountants

RECLAMATION DISTRICT NO. 773

FINANCIAL STATEMENTS
AND
INDEPENDENT AUDITOR'S REPORT

JUNE 30, 2022

CSV

CROCE, SANGUINETTI, & VANDER VEEN INC.

CERTIFIED PUBLIC ACCOUNTANTS

CONTENTS

CSV
CROCE, SANGUINETTI, & VANDER VEEN INC.
CERTIFIED PUBLIC ACCOUNTANTS

Independent Auditor's Report

To the Board of Trustees
Reclamation District No. 773
Stockton, California

Opinions

We have audited the accompanying financial statements of the governmental activities, each major fund, and the aggregate remaining fund information of **Reclamation District No. 773** (the District) as of and for the year ended June 30, 2022 and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective financial position of the governmental activities, each major fund, and the aggregate remaining fund information of **Reclamation District No. 773**, as of June 30, 2022, and the respective changes in financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinions

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the State Controller's Minimum Audit Requirements for California Special Districts. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of **Reclamation District No. 773,** and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about **Reclamation District No. 773's** ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

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Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with generally accepted auditing standards will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of **Reclamation District No. 773's** internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgement, there are conditions or events, considered in the aggregate, that raise substantial doubt about **Reclamation District No. 773's** ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

The District has omitted Management's Discussion and Analysis that accounting principles generally accepted in the United States of America require to be presented to supplement the basic financial statements. Such missing information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. Our opinion on the basic financial statements is not affected by this missing information.

Accounting principles generally accepted in the United States of America require that the statement of revenues, expenditures, and changes in fund balance - budget and actual - governmental funds on pages 21 through 22 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplemental information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Croce, Sanguinetti, & Vander Veen, Inc.

CROCE, SANGUINETTI, & VANDER VEEN, INC.
Certified Public Accountants
Stockton, California
January 4, 2023

RECLAMATION DISTRICT NO. 773

Statement of Net Position

June 30, 2022

	Governmental activities
Assets	
Cash and investments	$ 574,998
State assistance receivable - subventions	204,612
Prepaid expenses	7,559
Capital assets, net of accumulated depreciation of $832	5,407
Total assets	792,576
Deferred outflows of resources	-
Liabilities	
Accounts payable	18,053
Total liabilities	18,053
Deferred inflows of resources	-
Net position	
Net investment in capital assets	5,407
Unrestricted	769,116
Total net position	$ 774,523

The accompanying notes are an integral part of this financial statement.

RECLAMATION DISTRICT NO. 773

Statement of Activities

For the year ended June 30, 2022

	Expenses	Program revenues Operating grants and contributions	Net (expenses) revenues and changes in net position
Governmental activities			
Operations	$ 415,506	$ 219,497	$ (196,009)
Net program (expenses) revenues			(196,009)
General revenues			
Assessments			185,001
Interest			1,707
Miscellaneous			1,400
Total general revenues			188,108
Change in net position			(7,901)
Net position, beginning of year			782,424
Net position, end of year			$ 774,523

The accompanying notes are an integral part of this financial statement.

RECLAMATION DISTRICT NO. 773

Balance Sheet - Governmental Funds

June 30, 2022

	General fund
Assets	
Cash and investments	$ 574,998
Prepaid expenses	7,559
Total assets	$ 582,557
Liabilities and Fund Balances	
Liabilities	
Accounts payable	$ 18,053
Total liabilities	18,053
Fund balances	
Nonspendable:	
Prepaid expenses	7,559
Unassigned	556,945
Total fund balance	564,504
Total liabilities and fund balances	$ 582,557

The accompanying notes are an integral part of this financial statement.

RECLAMATION DISTRICT NO. 773

Reconciliation of the Governmental Funds Balance Sheet to the Statement of Net Position

June 30, 2022

Total fund balance - governmental funds		$ 564,504
Amounts reported for governmental activities in the statement of net position are different from those reported in the governmental funds because of the following:		
State assistance receivable are not available to pay current period expenditures and, therefore, not reported in the governmental funds balance sheet.		204,612
Capital assets used in governmental activities are not current financial resources and, therefore, are not reported in the governmental funds balance sheet.		
Capital assets	$ 6,239	
Less accumulated depreciation	(832)	
	$ 5,407	5,407
Net position of governmental activities		$ 774,523

The accompanying notes are an integral part of this financial statement.

RECLAMATION DISTRICT NO. 773

Statement of Revenues, Expenditures and Changes in Fund Balance - Governmental Funds

For the year ended June 30, 2022

	General Fund
Revenues	
Assessments	$ 185,227
State assistance	175,098
Interest	1,707
Miscellaneous	1,400
Total revenues	363,432
Expenditures	
Levee repairs and maintenance	256,753
Engineering	63,791
Weed abatement	24,999
Legal and accounting	24,124
Payroll expenses	15,673
Miscellaneous	9,108
Insurance	8,932
DWR Delta Grant	8,593
Dues and subscriptions	2,884
Five-year plan	25
Total expenditures	414,882
Net change in fund balance	(51,450)
Fund balance, beginning of year	615,954
Fund balance, end of year	$ 564,504

The accompanying notes are an integral part of this financial statement.

RECLAMATION DISTRICT NO. 773

Reconciliation of the Statement of Revenues, Expenditures and Changes in Fund Balance - Governmental Funds to the Statement of Activities

For the year ended June 30, 2022

Net change in fund balance - governmental funds	$ (51,450)
Amounts reported for governmental activities in the statement of activities are different because:	
Revenues in the statement of activities that do not provide current financial resources are not reported as revenues in the funds until such time as they are considered a current financial resource.	44,173
Depreciation expense related to capital assets is recognized in the statement of activities but is not reported in the funds.	(624)
Change in net position of governmental activities	$ (7,901)

The accompanying notes are an integral part of this financial statement.

Note A - Summary of Significant Accounting Policies

This summary of significant accounting policies of Reclamation District No. 773 (the District) is presented to assist in understanding the District's financial statements.

Description of the reporting entity

The District was formed in 1906 and operates under Section 50000 et. seq. of Division 15 of the California State Water Code to provide for the construction and maintenance of levees and drainage facilities to protect the area within the District's boundaries. The District is comprised of multiple landowners and is governed by a three-member board of trustees, each elected by the landowners to a four-year term.

District management considered all potential component units for inclusion in the reporting entity by applying the criteria set forth in accounting principles generally accepted in the United States of America. The District concluded that there are no potential component units which should be included in the reporting entity.

Government-wide financial statements

The government-wide financial statements (i.e., the Statement of Net Position and the Statement of Activities) report information on all of the activity of the primary government.

The statement of activities demonstrates the degree to which direct expenses of a given function or segment are offset by program revenues. Direct expenses are those that are clearly identifiable with a specific function or segment. Program revenues include 1) charges paid by the recipients of goods or services offered by the programs and 2) grants and contributions that are restricted to meeting the operational or capital requirements of a particular function or segment. Taxes and other receipts not classified as program revenues are presented as general revenues.

Fund financial statements

The fund financial statements provide information about the District's funds. The District has one type of fund (governmental), which is comprised of one major fund as follows:

General fund (major fund) - This fund is established to account for resources devoted to financing the general services that the District performs. Assessments and other sources of revenue used to finance the fundamental operations of the District are included in this fund. This fund is charged with all costs of operating the District for which a separate fund has not been established.

(Continued)

Note A - Summary of Significant Accounting Policies (Continued)

Measurement focus, basis of accounting, and financial statement presentation

The government-wide financial statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

Governmental fund financial statements are reported using the current financial resources measurement focus and the modified accrual basis of accounting. Revenues are recognized as soon as they are both measurable and available. Revenues are considered to be available when they are collectible within the current period or soon enough thereafter to pay liabilities of the current period. For this purpose, the government considers revenues to be available if they are collected within 60 days of the end of the current fiscal period and apply to the current fiscal period. Expenditures are recorded when the related fund liability is incurred, except for principal and interest on long-term debt, which are recognized as expenditures to the extent that they have matured.

Assessments and state assistance are considered to be susceptible to accrual and, therefore, have been recognized as revenues provided they were collected within 60 days of the end of the current fiscal period. All other revenue items are considered to be measurable and available only when cash is received by the District.

Cash and investments

For the purpose of financial reporting "cash and investments" includes all demand and savings accounts and certificates of deposit or short-term investments with an original maturity of three months or less.

Budgetary accounting

The District does not adopt an appropriated budget and is not required to adopt such a budget by law. However, the District does adopt a non-appropriated budget annually, which is approved by the Board of Trustees.

Capital assets

All capital assets are valued at historical cost or estimated historical cost if actual historical cost is not available. The District's policy is to capitalize all assets with costs exceeding certain minimum thresholds and with useful lives exceeding twelve months. The District has elected not to retroactively capitalize infrastructure capital assets acquired prior to July 1, 2003, as allowed by GASB Statement No. 34.

(Continued)

Note A - Summary of Significant Accounting Policies (Continued)

GASB Statement No. 34 requires that all capital assets with limited useful lives be depreciated over their estimated useful lives. Depreciation has been provided on capital assets and is charged as an expense against operations each year. The total amount of depreciation taken over the years is reported on the balance sheet as a reduction in the book value of capital assets.

Depreciation is provided using the straight-line method which means the cost of the asset is divided by its expected useful life in years and the result is charged to expense each year until the asset is fully depreciated. The District has assigned the useful lives listed below to capital assets.

Equipment	7-10 years

Major outlays for capital assets and improvements are capitalized as projects are constructed. The costs of normal maintenance and repairs that do not add to the value of the asset or materially extend asset lives are not capitalized.

Net position

Equity in the financial statements is classified as net position and displayed in three components as follows:

a. Net investment in capital assets - Consists of capital assets, net of accumulated depreciation and reduced by the outstanding balances of any borrowings that are attributable to the acquisition, construction or improvement of those assets.

b. Restricted - Consists of restricted assets reduced by liabilities and deferred inflows of resources related to these assets.

c. Unrestricted - Amounts not required to be reported in the other components of net position.

When both restricted and unrestricted resources are available for use, it is the District's policy to use restricted resources first, then unrestricted resources as they are needed.

Fund balance

In the fund financial statements, fund balance for governmental funds is reported in classifications that comprise a hierarchy based primarily on the extent to which the District is bound to honor constraints on the specific purpose for which amounts in the funds can be spent. Fund balance is reported in five components: nonspendable, restricted, committed, assigned and unassigned.

Nonspendable - Amounts that cannot be spent because they are either not spendable in form or are legally or contractually required to be maintained intact.

(Continued)

Note A - Summary of Significant Accounting Policies (Continued)

Restricted - Amounts constrained regarding use from restrictions externally imposed by creditors, grantors, contributors, or laws or regulations of other governments or by restrictions imposed by law through constitutional provisions or enabling legislation.

Committed - Amounts constrained regarding use for specific purposes pursuant to requirements imposed by formal action of the District's highest level of decision-making authority.

Assigned - Amounts constrained by the District's intent to be used for specific purposes, but are neither restricted nor committed. The authority for assigning fund balance is expressed by the Board of Trustees, District manager or their designee.

Unassigned - Amounts that have not been restricted, committed or assigned to specific purposes within the general fund. The general fund is the only fund that reports a positive unassigned fund balance amount. Other governmental funds besides the general fund can only report a negative unassigned fund balance amount.

When both restricted and unrestricted resources are available for use, it is the District's policy to use restricted resources first, then unrestricted resources (committed, assigned and unassigned) as they are needed. When unrestricted resources (committed, assigned and unassigned) are available for use it is the District's policy to use committed resources first, then assigned, and then unassigned as they are needed.

Assessments

Assessments are levied at the discretion of the Board of Trustees. Assessments are based on the assessment valuation of land or acreage within the District.

Demand warrants

The District is authorized under the California State Water Code to issue demand warrants.

Fair value measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The District categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The fair value hierarchy categorizes the inputs to valuation techniques used to measure fair value into three levels based on the extent to which inputs used in measuring fair value are observable in the market.

(Continued)

Note A - Summary of Significant Accounting Policies (Continued)

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2 inputs are inputs other than quoted prices included within Level 1 - that are observable for an asset or liability, either directly or indirectly.

Level 3 inputs are unobservable inputs for an asset or liability.

If the fair value of an asset or liability is measured using inputs from more than one level of the fair value hierarchy, the measurement is considered to be based on the lowest priority level input that is significant to the entire measurement.

Estimates

The preparation of the basic financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Actual results could differ from those estimates.

The state assistance receivable - subventions in the amount of $204,612 as reported on the statement of net position as of June 30, 2022 represents management's estimates of reimbursable state assistance for subvention eligible expenses relative to the fiscal year ended June 30, 2022. Although considerable variability is inherent in these estimates, management believes that the accrual for state assistance receivable is adequate.

New accounting pronouncements

Standards adopted

In January 2020, the Governmental Accounting Standards Board (GASB) issued GASB Statement No. 92, *Omnibus 2020*. The objectives of this Statement is to enhance comparability in accounting and financial reporting and to improve the consistency of authoritative literature by addressing practice issues that have been identified during implementation and application of certain GASB statements. The District implemented the provisions of this Statement for the year ended June 30, 2022. The adoption of this Statement had no impact on the District's financial statements.

Note B - Cash and Investments

Cash and investments of the District as of June 30, 2022, consist of the following:

	Carrying amount	Bank balance	Fair value
Unrestricted			
Deposits in commercial accounts			
Public checking	$ 32,984	$ 32,984	$ -
Investment in external investment pool			
San Joaquin County Treasurer	542,014	-	542,014
Total cash and investments	$ 574,998	$ 32,984	$ 542,014

Deposit and Investment Policy

California statutes authorize special districts to invest idle, surplus, or reserve funds in a variety of credit instruments as provided for in the California Government Code, Section 53600. As specified in Government Code 53600.5, when investing, reinvesting, purchasing, acquiring, exchanging, selling or managing the District's funds, the primary objectives, in priority order, of the District's investment activities and of the District's investment policy shall be (1) safety, (2) liquidity, and (3) yield. It is the policy of the District to invest public funds in a manner to obtain the highest return obtainable with the maximum security while meeting the daily cash flow demands of the District as long as investments meet the criteria established by this policy for safety and liquidity and conform to all laws governing the investment of District funds.

The District is provided a broad spectrum of eligible investments under California Government Code Sections 53600-53609 (authorized investments), 53630-53686 (deposits and collateral), and 16429.1 (Local Agency Investment Fund). The District may choose to restrict its permitted investments to a smaller list of securities that more closely fits the District's cash flow needs and requirements for liquidity. The table below identifies the investment types that are authorized for the District by the California Government Code, Section 53600 (or District's investment policy, where more restrictive) that address interest rate risk, credit risk and concentration of credit risk.

(Continued)

Note B - Cash and Investments (Continued)

Authorized Investment Type	Maximum Maturity	Maximum Percentage of Portfolio	Maximum Investment in One Issuer
U.S. Treasury Bills, Notes, and Bonds	5 years	None	None
U.S. Government Agency Obligations	5 years	None	None
Repurchase Agreements	1 year	None	None
State Registered Warrants, Notes or Bonds	5 years	None	None
Bankers Acceptances	180 days	40%	30%
Commercial Paper	270 days	30%	10%
Time Deposits	1 year	30%	None
Medium Term Corporate Notes	3 years	30%	None
Mutual Funds	N/A	20%	10%
Bank Deposits	N/A	10%	10%
Local Agency Investment Fund (LAIF)	N/A	None	None
Local Government Investment Pools	N/A	None	None
Capital Asset Management Program	N/A	10%	None

The District complied with the provisions of California Government Code (or the District's investment policy, where more restrictive) pertaining to the types of investments held, institutions in which deposits were made and security requirements. The District will continue to monitor compliance with applicable statutes pertaining to public deposits and investments. The District does not maintain a formal investment policy.

Disclosures Relating to Interest Rate Risk

Interest rate risk is the risk that changes in market interest rates will adversely affect the fair value of an investment. Generally, the longer the maturity of an investment, the greater the sensitivity of its fair value to changes in market interest rates. One of the ways that the District manages its exposure to interest rate risk is by purchasing a combination of shorter term and longer-term investments and by timing cash flows from maturities so that a portion of the portfolio matures or comes close to maturity evenly over time as necessary to provide the cash flow and liquidity needed for operations.

(Continued)

Note B - Cash and Investments (Continued)

Information about the sensitivity of the fair values of the District's investments to market interest rate fluctuations is provided by the following table that shows the distribution of the District's investments by maturity:

		Remaining maturity (in months)					
Investment type	Total	12 months or less	13 - 24 months	25 - 36 months	37-48 months	49-60 months	More than 60 months
San Joaquin County Treasurer	$ 542,014	$ 542,014	$ -	$ -	$ -	$ -	$ -
	$ 542,014	$ 542,014	$ -	$ -	$ -	$ -	$ -

Disclosures Relating to Credit Risk

Generally, credit risk is the risk that an issuer of an investment will not fulfill its obligation to the holder of the investment. This is measured by the assignment of a rating by a nationally recognized statistical rating organization. Presented below is the minimum rating required by (where applicable) the California Government Code or the District's investment policy, and the actual rating as of fiscal year end for each investment type.

				Rating as of Fiscal Year End			
Investment Type	Amount	Minimum Legal Rating	Exempt From Disclosure	AAA	AA	A	Not Rated
San Joaquin County Treasurer	$ 542,014	N/A	$ -	$ -	$ -	$ -	$ 542,014
Total	$ 542,014	N/A	$ -	$ -	$ -	$ -	$ 542,014

Concentration of Credit Risk

The District had no investment policy limiting the amount that can be invested in any one issuer beyond that stipulated by the California Government Code. The District's investments are concentrated in external investment pools which are not subject to investment limits.

(Continued)

Note B - Cash and Investments (Continued)

Custodial Credit Risk

Custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, a government will not be able to recover its deposit or will not be able to recover collateral securities that are in the possession of an outside party. The custodial credit risk for investments is the risk that, in the event of the failure of the counterparty (e.g. broker-dealer) to a transaction, a government will not be able to recover the value of its investment or collateral securities that are in the possession of another party. The California Government Code and the District's investment policy do not contain legal or policy requirements that would limit the exposure to custodial credit risk for deposits or investments, other than the following provision for deposits. The California Government Code requires that a financial institution secure deposits made by state or local governmental units by pledging securities in an undivided collateral pool held by a depository regulated under state law (unless so waived by the government unit). The market value of the pledged securities in the collateral pool must equal at least 110% of the total amount deposited by the public agencies. California law also allows financial institutions to secure District deposits by pledging first trust deed mortgage notes having a value of 150% of the secured public deposits.

As of June 30, 2022, the District's bank balance was $32,984 and $32,984 of that amount was insured by the Federal Deposit Insurance Corporation and collateralized as required by state law.

Investment in External Investment Pool

The District's investment in the San Joaquin County investment pool is managed by the San Joaquin County Treasurer and is stated at fair value or amortized cost, which approximates fair value. Cash held by the San Joaquin County Treasury is pooled with other County deposits for investment purposes by the County Treasurer in accordance with the investment policy of the County Treasurer (see County Treasurer's investment policy at http://www.sjgov.org/treasurer/). The Pool has established a treasury oversight committee to monitor and review the management of public funds maintained by the Pool. Participants' equity in the investment pool is determined by the dollar amount of the participant deposits, adjusted for withdrawals and distributed investment income. Investment income is prorated to individual funds based on their average daily cash balances. In accordance with applicable State laws, the San Joaquin County Treasurer may invest in derivative securities. However, at June 30, 2022, the San Joaquin County Treasurer's pooled investment fund contained no derivatives or other investments with similar risk profiles.

(Continued)

Note B - Cash and Investments (Continued)

Fair Value Hierarchy

The District categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure fair value of the assets. Level 1 inputs are quoted prices in an active market for identical assets; Level 2 inputs are significant other observable inputs; and Level 3 inputs are significant unobservable inputs.

The District's investment in the County of San Joaquin Treasury Pool is classified as Level 2 and its value is based on the fair value factor provided by the Treasurer of the County of San Joaquin, which is calculated as the fair value divided by the amortized cost of the investment pool.

Note C - Capital Assets

Capital asset activity for the year ended June 30, 2022 is as follows:

	Balance July 1, 2021	Additions	Disposals	Balance June 30, 2022
Depreciable capital assets				
Equipment	$ 6,239	$ -	$ -	$ 6,239
Total depreciable capital assets	6,239	-	-	6,239
Less accumulated depreciation	(208)	(624)	-	(832)
Total depreciable capital assets, net	6,031	(624)	-	5,407
Total capital assets, net	$ 6,031	$ (624)	$ -	$ 5,407

Note D - State Assistance

The District is participating in the California Delta Levee Maintenance Subventions Program. This program provides funding on a cost share basis to local levee maintaining agencies for rehabilitation and maintenance of levees in the Delta. In addition, the District entered into a project funding agreement with the State of California Department of Water Resources for preparation of the five-year plan for the District.

Note E - Joint Venture (Joint Powers Agreement)

The District is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; risk of loss to employees; and natural disasters. In order to insure for risks of loss, the District participates in a joint venture under a joint powers agreement with the California Association of Mutual Water Companies Joint Powers Risk and Insurance Management Authority (JPRIMA). The relationship between the District and the JPRIMA is such that the JPRIMA is not a component unit of the District for financial reporting purposes. The JPRIMA arranges for and provides property, liability, crime, public officials and management liability, auto, and excess liability coverage for its member districts. Each member district pays a premium commensurate with the level of coverage requested and shares surpluses and deficits proportionate to their participation in the JPRIMA. The District's share of surpluses and deficits cannot be determined, although District management does not expect such amounts, if any, to be material in relation to the financial statements. As of June 30, 2022, the District's insurance coverage includes general liability insurance with liability limits of $1,000,000 per occurrence and $10,000,000 in the aggregate. The District also has an excess liability policy with additional liability limits of $1,000,000 per occurrence and $1,000,000 in the aggregate.

Note F - Governing Board

As of June 30, 2022, the three members of the District's Board of Trustees were as follows:

Trustee	Term expires
Mark Bacchetti, President	December 2023
Ryan Bacchetti	December 2023
Joseph Enos	December 2023

Note G - Contingencies

On March 11, 2020, the World Health Organization declared the outbreak of a coronavirus (COVID-19) a pandemic. Subsequent to the declaration of a pandemic, a variety of federal, state, and local governments have taken actions in response to the pandemic, which have ranged in jurisdiction, but are generally expected to result in a variety of negative economic consequences, the scope of which are not currently known or quantifiable. The duration and intensity of the impact of the coronavirus and resulting impact to the District is unknown.

REQUIRED SUPPLEMENTAL INFORMATION

RECLAMATION DISTRICT NO. 773

Statement of Revenues, Expenditures, and Changes in Fund Balance - Budget and Actual - Governmental Funds

Year ended June 30, 2022

	General fund		
	Budgeted amounts original/final	Actual amounts	Variance with final budget positive/ (negative)
Revenues			
Assessments	$ 195,300	$ 185,227	$ (10,073)
State assistance - subventions	150,000	175,098	25,098
Interest	3,400	1,707	(1,693)
Miscellaneous	14,500	1,400	(13,100)
State assistance - five-year plan	15,000	-	(15,000)
Total revenues	378,200	363,432	(14,768)
Expenditures			
Levee repairs and maintenance	460,000	256,753	203,247
Engineering	25,000	63,791	(38,791)
Weed abatement	45,000	24,999	20,001
Legal and accounting	27,000	24,124	2,876
Payroll expenses	-	15,673	(15,673)
Miscellaneous	300	9,108	(8,808)
Insurance	13,000	8,932	4,068
DWR Delta Grant	-	8,593	(8,593)
Dues and subscriptions	4,000	2,884	1,116
Five-year plan	15,000	25	14,975
Rodent control	30,000	-	30,000
Capital outlay	22,000	-	22,000
Total expenditures	641,300	414,882	226,418
Net change in fund balance	(263,100)	(51,450)	211,650
Fund balance, beginning of year	615,954	615,954	-
Fund balance, end of year	$ 352,854	$ 564,504	$ 211,650

The accompanying notes are an integral part of this financial statement.

RECLAMATION DISTRICT NO. 773

Notes to Required Supplemental Information

June 30, 2022

The District prepares a budget annually which is approved by the Board of Trustees setting forth the contemplated fiscal requirements. The District's budget is maintained on the modified accrual basis of accounting. The results of operations are presented in the budget to actual schedule in accordance with the budgetary basis.

Reported budget amounts reflect the annual budget as originally adopted and the final adopted amounts. There were no amendments to the budget during the year ended June 30, 2022. The budget amounts are based on estimates of the District's expenditures and the proposed means of financing them. Actual expenditures for certain line items may vary significantly from the budget due to timing of such expenditures.

ITEM 7

RECLAMATION DISTRICT NO. 773
FABIAN TRACT
BOARD OF TRUSTEES MEETING
TUESDAY, APRIL 4, 2023
9:00 AM
ENGINEER'S REPORT

A. Review the status of levee repairs associated with the 2022/23 High Water event. Ratify Dino and Son contract to place screened aggregate material from Cal Neva Barrier Projects to repair rills in the District's levee. The Project will be for less than $25,000 and will take place over the week of 4/3/23 - 4/7/23.

EXHIBIT A: Photo summary from KSN Daily Field Reports of All Weather Road Repairs

B. Review outcome of Paradise Cut Expansion & South Delta Restoration Project Public Workshop held on March 23, 2023, at Roberts Union Farm Center.

EXHIBIT B: Public Workshop Notice

EXHIBIT C: Meeting Agenda

EXHIBIT D: PowerPoint Slide show.

EXHIBIT E: Memorandum regarding proposed strategies to address concerns of Landowners and Reclamation District's Downstream of the Paradise Cut Expansion and South Delta Restoration Project, (with handwritten notes and highlights)

EXHIBIT F: Paradise Cut Expansion and South Delta Restoration Project (Existing and Needed Technical Studies)

Exhibit A

046

Exhibit B

You're invited to provide feedback on the

Paradise Cut Expansion & South Delta Restoration Project!

PUBLIC WORKSHOP

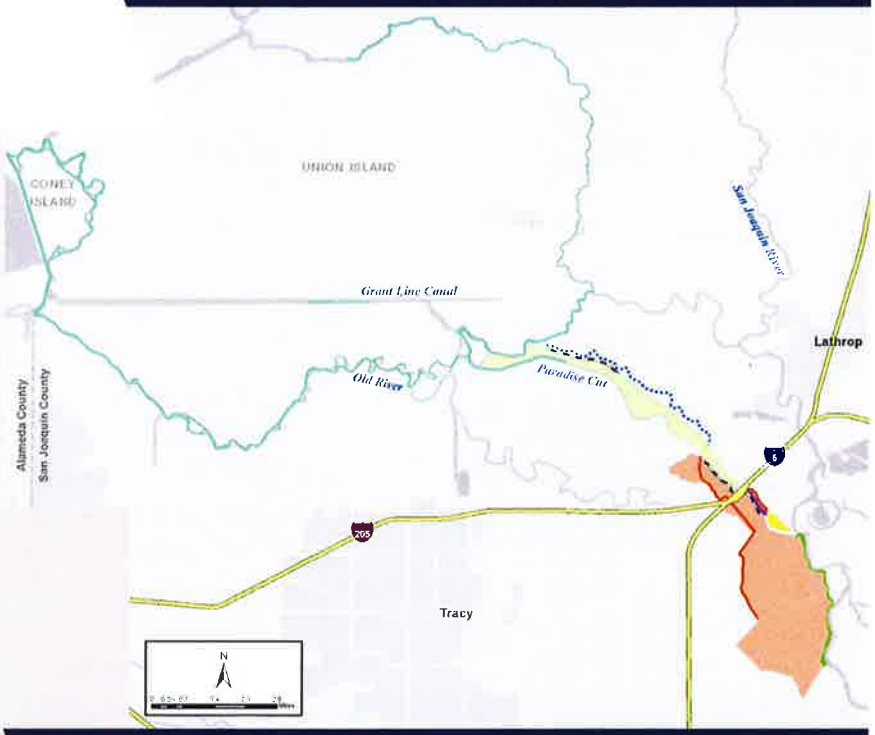
MARCH 23, 2023

PROJECT

The San Joaquin County Resource Conservation District is working with American Rivers, the South Delta Water Agency, and other partners to explore expansion of the Paradise Cut Bypass to improve flood protection and enhance habitat, as well as address downstream impacts from Bypass expansion. In response to local agency input, the project has expanded in recent years to include downstream channel restoration for water supply reliability and environmental restoration. The addition of channel restoration is critical to maintain local support for the overall effort.

Attend the meeting to learn and provide feedback on the following questions:

- What is the Paradise Cut Expansion & South Delta Restoration Project?
- What strategies are needed to minimize negative hydraulic impacts and improve downstream outcomes?
- What studies do you think are important to ensure the project achieves its intended objectives?



9 AM - 11 AM

Refreshments provided!

RSVP here by clicking on this link:
https://forms.gle/Ef3WqSTAJxkuWXpy6

Roberts Union Farm Center
4925 Howard Road Stockton, CA

Partners: American Rivers — Rivers Connect Us® · San Joaquin Area Flood Control Agency · San Joaquin County Resource Conservation District · San Joaquin County Flood Control & Water Conservation District · South Delta Water Agency · River Partners · Lathrop

Exhibit C

SAN JOAQUIN COUNTY
RESOURCE CONSERVATION DISTRICT

AGENDA

Paradise Cut Expansion & South Delta Restoration Project Public Outreach Meeting

March 23, 2023 | 9:00 AM – 11:00 AM
Roberts Union Farm Center
4925 Howard Rd.
Stockton, CA 95206

Planning Team

Phil Balmat, San Joaquin County Resource Conservation District
Krista McCoon, San Joaquin County Resource Conservation District
John Herrick, South Delta Water Agency
Chris Elias, San Joaquin Area Flood Control and Water Conservation District
Madeline Baker, LWA
Bill Eisenstein, ESA
Brian Haines, ESA
Sarah Puckett, American Rivers
Sara Simmons, Consero Solutions
Petrea Marchand, Consero Solutions

Meeting Purpose: To hear your thoughts, concerns, and suggestions for the measures needed to address downstream concerns important of the Paradise Cut Expansion and South Delta Restoration Project and any additional studies you feel are necessary for the project to be successful.

1. Introduction & Welcome
2. About the Paradise Cut Expansion & South Delta Restoration Project
3. Break (Map Comments / Input)
4. Addressing Downstream Concerns
5. Future of the Project & Next Steps
6. Final Questions & Close

Exhibit D

MEETING GROUND RULES

- This is a public discussion, not a debate.
- Everyone is encouraged to participate.
- No individuals should dominate a discussion.
- One person speaks at a time.
- Listen to and respect other points of view.

2

PHASE 2 PARTNERS

SAN JOAQUIN AREA FLOOD CONTROL AGENCY

South Delta Water Agency

SACRAMENTO - SAN JOAQUIN DELTA CONSERVANCY
A California State Agency

SAN JOAQUIN COUNTY RESOURCE CONSERVATION DISTRICT

Lathrop

ESA

STATE OF CALIFORNIA CENTRAL VALLEY FLOOD PROTECTION BOARD

AMERICAN RIVERS

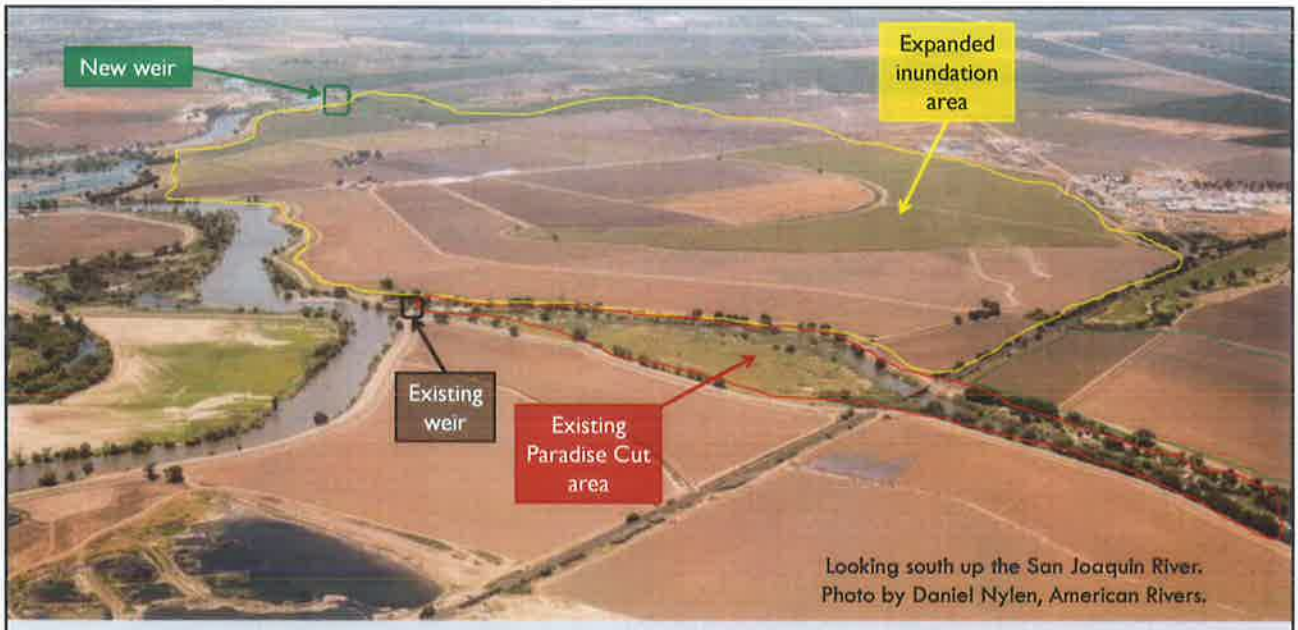
RIVER PARTNERS

CALIFORNIA DEPARTMENT OF WATER RESOURCES

CONSEROSOLUTIONS

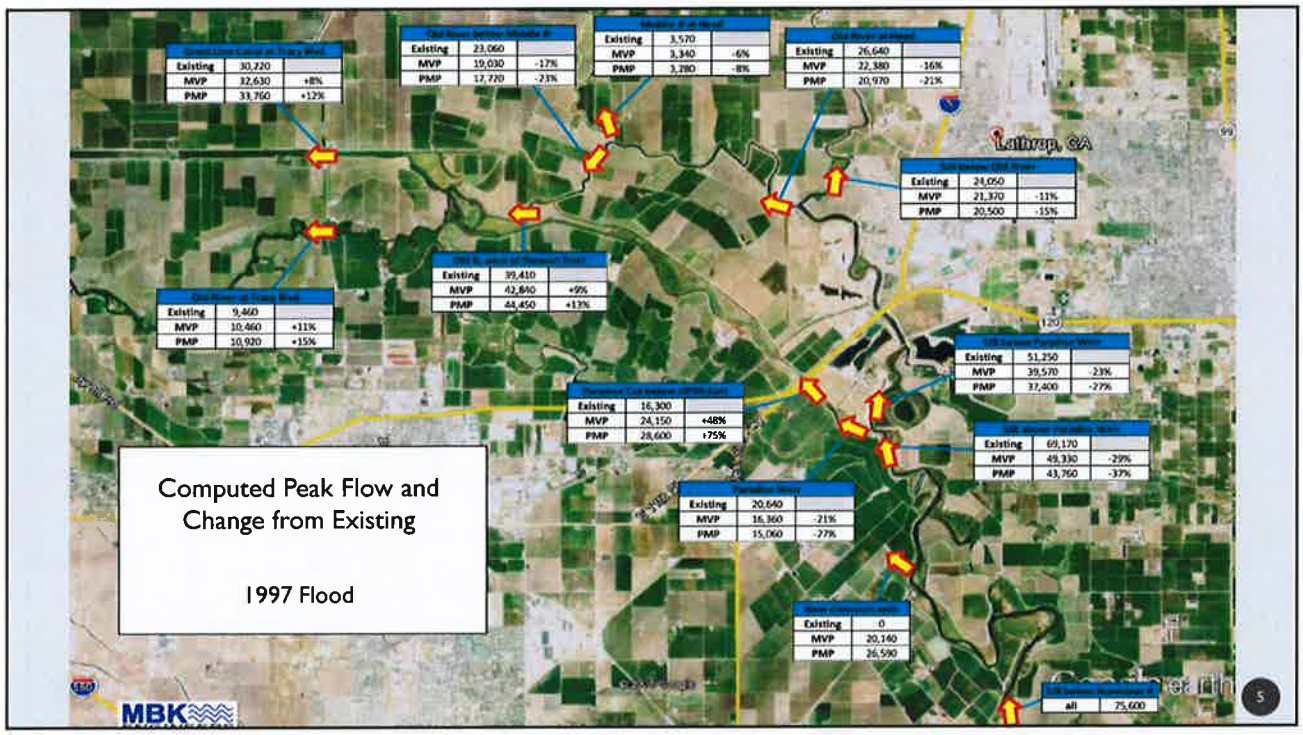
MBK ENGINEERS

3



PARADISE CUT EXPANSION & SOUTH DELTA RESTORATION PROJECT

4

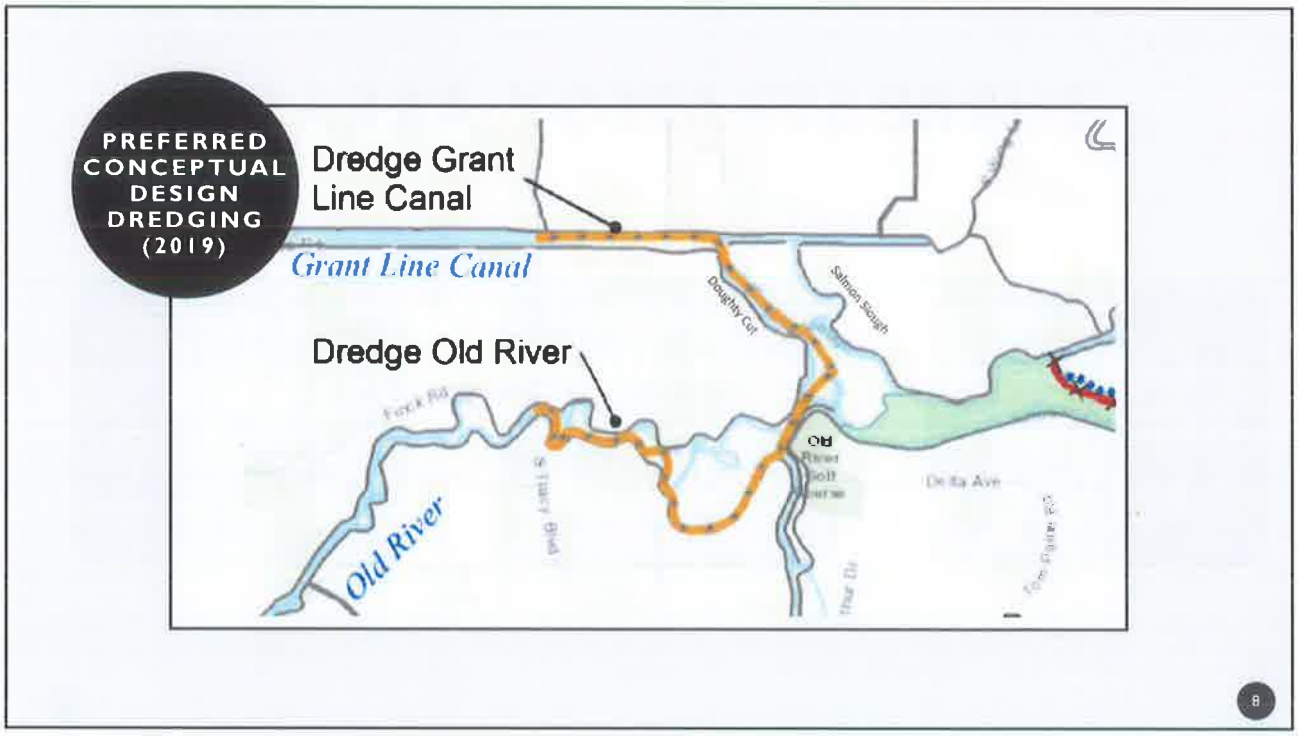


THREE STRATEGY AREAS

- Channel Restoration & Expansion
- Downstream Flood Risk Reduction
- Habitat Restoration

6


PREFERRED CONCEPTUAL DESIGN (2019)
Dredge Grant Line Canal
Grant Line Canal
Dredge Old River
Old River
Right Bank Levee Setback Completed by River Islands in 2019
Paradise Cut
Lathrop
Stewart Tract and River Islands development
Restricted Riparian
Existing Weir
205
250-ft Expansion of Undercrossing of East Railroad
Purchase of Flowage Easement
Tracy
Deuel Vocational Institution (existing)
Seasonal Agriculture
Upper Weir (1000 ft)
7


PREFERRED CONCEPTUAL DESIGN DREDGING (2019)
Dredge Grant Line Canal
Grant Line Canal
Dredge Old River
Old River
Doughty Cut
Salmon Slough
8

CURRENT CONCEPTUAL DESIGN DREDGING (2023)

9

GOVERNANCE

SAN JOAQUIN AREA
FLOOD CONTROL AGENCY

CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Advisory Committee

10

PROJECT TIMELINE

2017
First Sacramento-San Joaquin Delta Conservancy Prop 1 Grant

→

2019
Development of Preferred Conceptual Design

→

2019
Second Sacramento-San Joaquin Delta Conservancy

↓

2021
Planning Guide for the Channel Depth Restoration Program for the South Delta

→

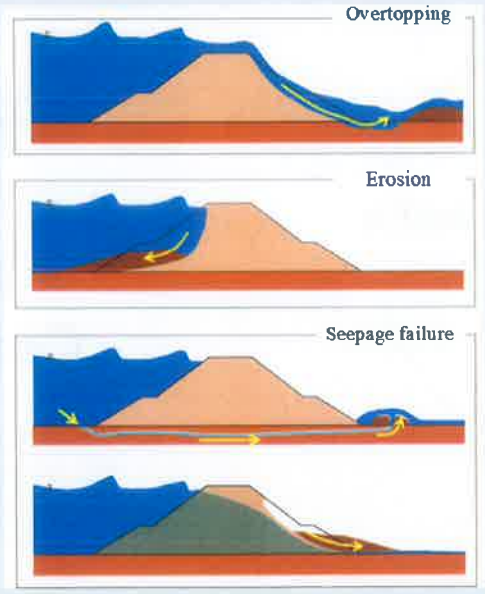
2022
Completed MOU between SJAFCA and the RDs

→

2023
$3 million from DWR

11

LEVEE FAILURE MODES



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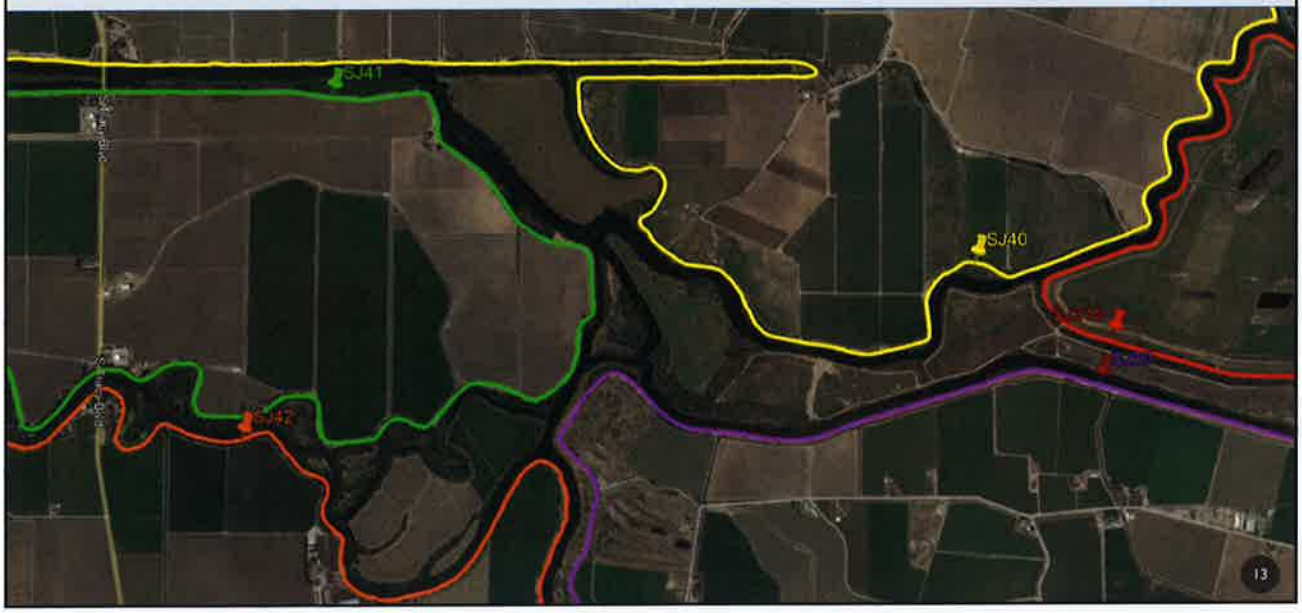
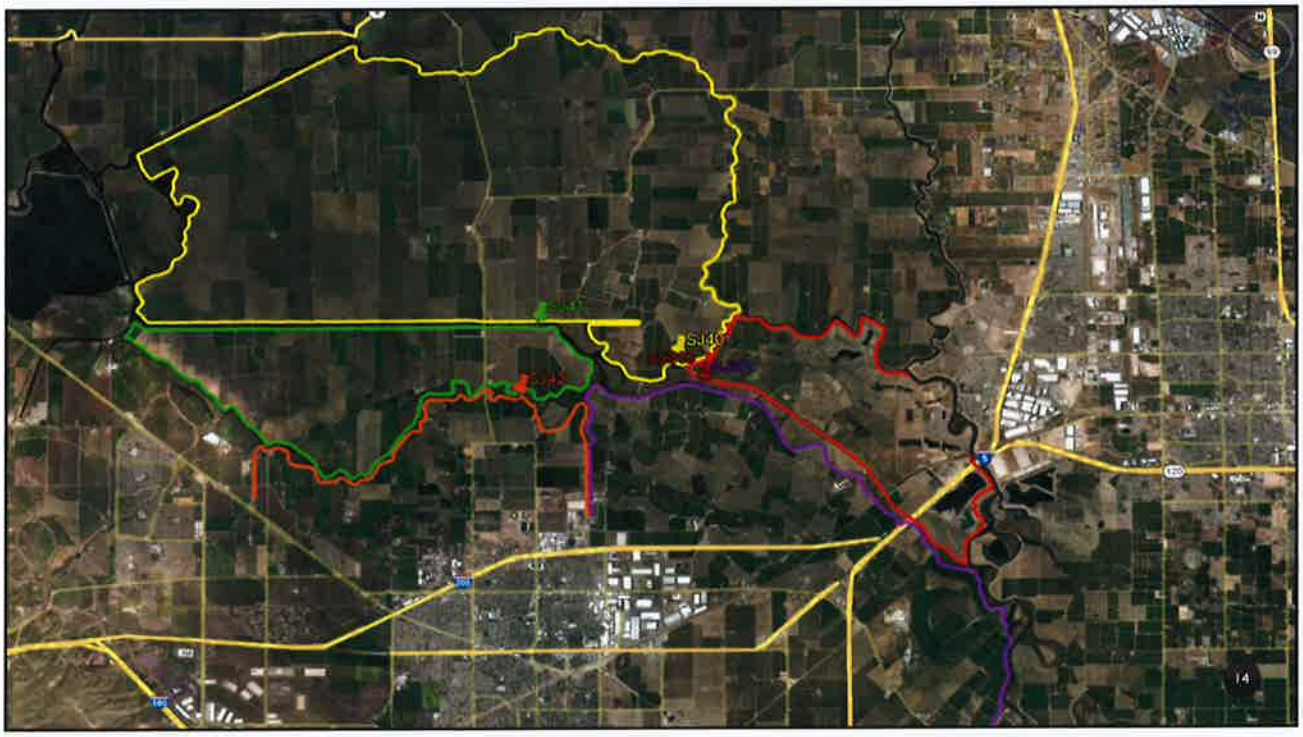
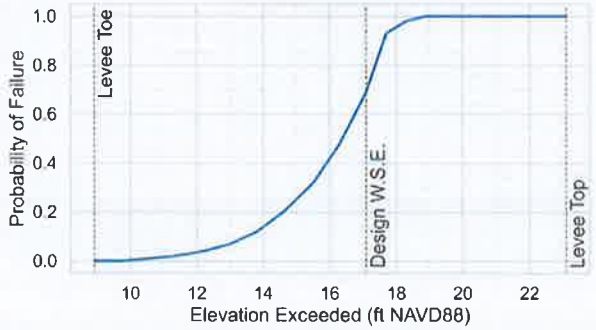
FIVE INDEX POINTS



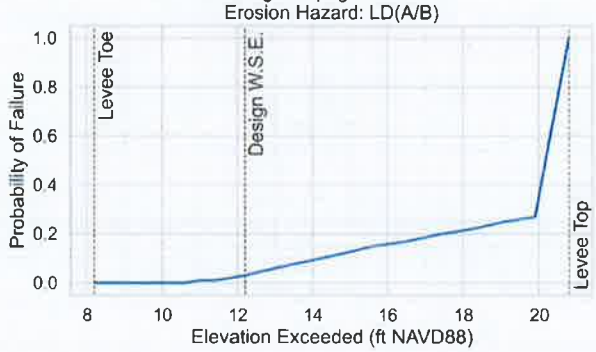


LEVEE FAILURE CURVES

Index Point SJ40
Underseepage Hazard: C-
Stability Hazard: LD(A/B)
Throughseepage Hazard: C-
Erosion Hazard: C-



Index Point SJ42
Underseepage Hazard: LD(A/B)
Stability Hazard: A
Throughseepage Hazard: A
Erosion Hazard: LD(A/B)



15

RESULTS AT FIVE INDEX POINTS

Index Point	Reach	Design Water Surface Elevation (ft)*	Hazard Rating**				Probability of Failure (Pf)		
			Erosion	Stability	Through-seepage	Under-seepage	DWSE	DWSE + 0.3 ft	Change in Pf
SJ30	Paradise Cut	19.3	C-	A	C	C	51%	70%	19%
SJ31b	Paradise Cut	24.6	C	A	C	C	40%	70%	30%
SJ40	Old River	17.1	C-	LD (A/B)	C-	C-	69%	83%	14%
SJ41	Grant Line	13.2	LD (A/B)	LD (A/B)	LD (A/B)	LD (A/B)	5%	7%	2%
SJ42	Old River	12.2	LD (A/B)	A	A	LD (A/B)	3%	5%	2%

NOTES:

* Using NAVD88 benchmark

** LD signifies "limited data"

16

FEEDBACK – DREDGING LOCATION? PRIORITIES?

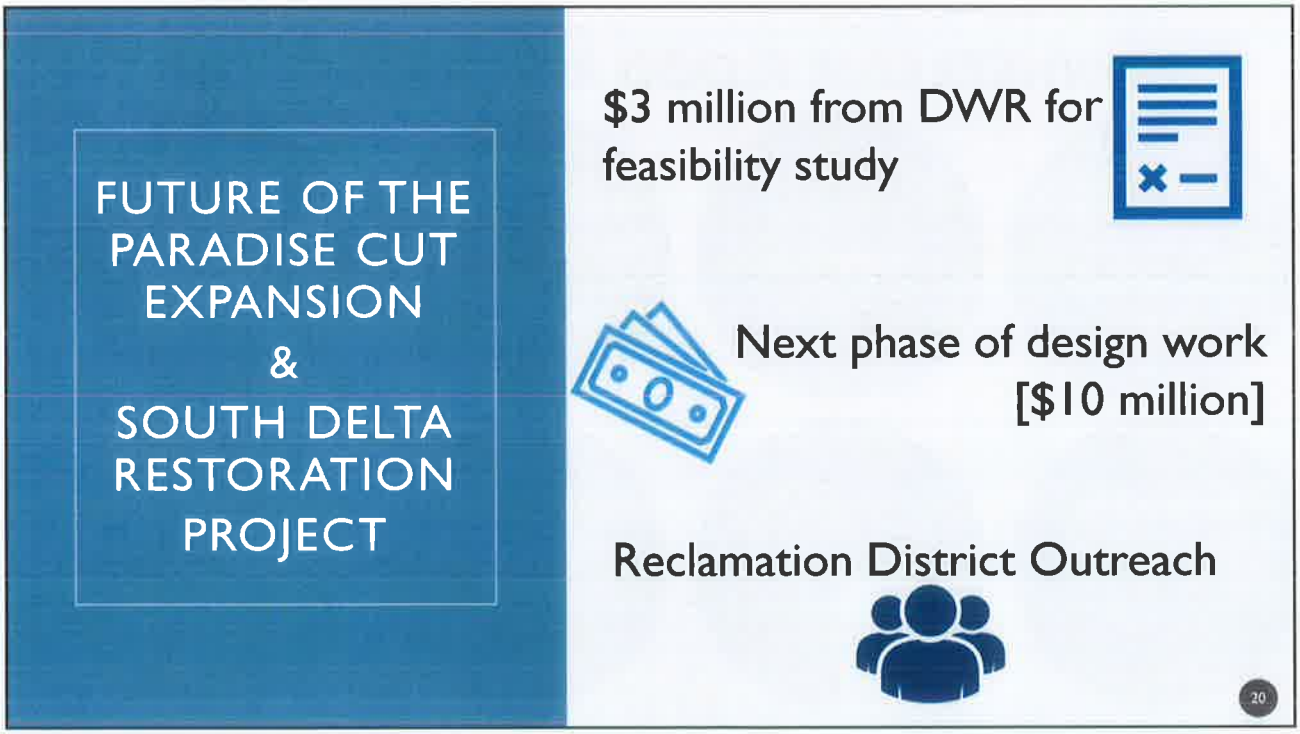
17

DOWNSTREAM FLOOD RISK REDUCTION

- Using dredge spoils to improve downstream levees
- Stabilizing levees with riprap
- Decreasing levee seepage with cutoff walls and seepage berms
- Setting back levees to decrease flood risk
- Reconnecting floodplains to decrease sediment
- Decreasing levee erosion using vegetation
- Integrating ecological levee rehabilitation elements
- Monitoring & maintaining levees

18


HABITAT RESTORATION
Hyacinth/Egeria Removal
Tom Paine Slough Habitat Enhancement Project
Grant Line Canal/Fabian Bell Canal Channel Islands Preservation
100-acre Interior Channel Island Restoration
Salmon Slough Restoration
Paradise Cut Habitat Enhancement
Old River/Middle River Channel Island Preservation
Grant Line Canal Habitat Restoration
19


FUTURE OF THE PARADISE CUT EXPANSION & SOUTH DELTA RESTORATION PROJECT
$3 million from DWR for feasibility study
Next phase of design work [$10 million]
Reclamation District Outreach
20

THANK YOU!

Looking South up the San Joaquin River.
Photo by Daniel Nylen

CONTACTS

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SJC RCD: sjcrcd@outlook.com

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Exhibit E

SJ40 GRADE C-

SJ42 A

SDNA-HAS INCLUDED IN ITS BUDGET TO COVER ENGR EXPENSE OF RDs TO SERVE ON ADVISORY BOARD

* 3.0M FOR SJAFCA KICKOFF - NOT YET RECVD

* 10M FORTHCOMING FROM DWR

DG. MAKE URBAN AREAS PAY FOR

+ 0.3 FT MAX POTENTIAL IMPACT

MEMORANDUM

To: Interested Parties

From: San Joaquin County Resource Conservation District

RE: Proposed Strategies to Address Concerns of Landowners and Reclamation Districts Downstream of the Paradise Cut Expansion and South Delta Restoration Project

DREDGING LIMITS HAVE TO TAKE INTO ACCOUNT

MOVE SJ 41 TO THE WEST

FUTURE DESIGN CONSIDERATION

Date: March 6, 2023

STOPPING DUE TO WORK WINDOWS PREMATURELY BEFORE GETTING AN ENTIRE CHANNEL DREDGED. YOU DON'T WANT TO CAUSE A HYDRAULIC JUMP

SMILES OF DREDGING @ 2' DEPTH -

The proposed Paradise Cut Expansion and South Delta Restoration Project (Project) is a multi-benefit project proposed in the southern Sacramento-San Joaquin Delta (Delta) in the Central Valley, California. The goals of the Project are to reduce catastrophic flood risk to people and property in the South Delta; to restore riparian and other native habitats for Swainson's hawk, riparian brush rabbit, riparian songbirds, and other species; and to restore channel capacity (otherwise known as dredging) in portions of the South Delta downstream of Paradise Cut. The expanded flood bypass is estimated to reduce river flood stage by 0.7 – 3.0 feet along a 28-mile corridor of the San Joaquin River adjacent to Manteca, Lathrop, and Stockton.

PURPOSE OF MEMO

This memo describes potential impacts downstream of the Project and proposed strategies to address concerns with downstream impacts to landowners and reclamation districts located downstream of the proposed Project, including strategies to address concerns with hydraulic impacts downstream of the Project, which are above and beyond legal and permitting requirements. This memo provides information about these impacts and strategies so landowners and reclamation districts located downstream of the Project can provide feedback at a March 23, 2023, public meeting hosted by the San Joaquin County Resource Conservation District (RCD).

The RCD, in partnership with American Rivers and the South Delta Water Agency (collectively referred to as "Partners"), led early planning efforts to develop the Project, and worked with reclamation districts to select the San Joaquin Area Flood Control Agency (SJAFCA) to lead the Project going forward in collaboration with Partners, local municipalities, and local reclamation districts. The Partners further completed a Preferred Conceptual Design for the Project in 2019. In 2021, the South Delta Water Agency also hired the consulting firm Anchor QEA to conduct an analysis of additional dredging,

known as the Anchor report. The Preferred Conceptual Design already included significant dredging in response to concerns expressed by landowners downstream of the Project about potential impacts; the South Delta Water Agency commissioned the Anchor report to further address these concerns. SJAFCA will further evaluate the Preferred Conceptual Design and the Anchor report as part of a feasibility study beginning in 2023. From the RCD's perspective, the Project currently includes both the Preferred Conceptual Design and the additional dredging recommended in the Anchor report. The Project is currently only a concept, however, as there are no engineering drawings, restoration plans, formal project descriptions, or project specifications, so the SJAFCA-led Feasibility Study is likely to include Project updates.

Some of the proposed strategies to address downstream concerns with hydraulic impacts from the Project are included within the Preferred Conceptual Design, such as restoring channel depth (e.g., dredging). This memo outlines further strategies SJAFCA may wish to consider adding to the Project, as well as proposed habitat enhancement projects to further increase the attractiveness of the Project to agencies interested in funding multi-benefit projects. This memo distinguishes between avoidance or mitigation strategies required by the California Environmental Quality Act, the National Environmental Policy Act, or other permitting processes and strategies to address landowner and reclamation district concerns with hydraulic impacts downstream of the Project, which expand beyond legal and permitting requirements.

At the workshop, the RCD will request feedback on Environmental Science Associates' (ESA) analysis of potential impacts downstream of the Project (Attachment A); and the three specific strategy areas to address concerns with impacts downstream of the Project, including:

1. Channel depth restoration and capacity expansion
2. Downstream flood risk reduction
3. Habitat restoration

A more detailed description of ESA's analysis of impacts and strategies to address concern are described below.

The SJAFCA-led feasibility study (estimated to be completed 2025) will determine whether strategies to address concerns with downstream impacts the RCD recommends to SJAFCA as part of this process are ultimately included in the Project; there is no guarantee SJAFCA will construct any project generated through this process because of costs or other constraints.

PROJECT BACKGROUND

From the RCD's perspective, the Project currently includes both the Preferred Conceptual Design (**Figure 1**) and the additional dredging recommended in the 2021 Anchor report (**Figure 2**). The Project is only a concept and will change as SJAFCA analyzes the feasibility of project elements. The current Project includes:

- Up to 25 miles of dredging, in depths ranging from 6 to 8 feet, to restore several South Delta channels (Old River, Middle River, Fabian & Bell Canal, Tom Paine Slough and Paradise Cut) to their deepest historical elevations
- Installation of a new 1,000-foot weir on the left bank of the San Joaquin River approximately 3.1 river miles upstream of the existing rock weir
- Construction of about 7.8 miles of new setback levee, beginning about 1.3 miles away from the new weir at the southwest corner of the Deuel Vocational Facility, and including a 3.6-mile stretch of new setback levee on the right bank that was permitted and constructed by the ongoing River Islands Development project
- Potential setback of additional Paradise Cut levees for additional benefits as agreed to by local reclamation districts and landowners
- Modifications to rock embankments where two railroad lines, the eastern Union Pacific Railroad (a.k.a. the "eastern railroad") and the western Southern Pacific Railroad (a.k.a. the "western railroad"), and Interstate 5 cross Paradise Cut
- A 250-foot expansion of the eastern railroad undercrossing
- Installation of a new check valve structure on an existing conveyance structure that brings water into Tom Paine Slough to limit floodwaters from entering Tom Paine Slough at times of high flow
- Conversion of about 0.5 miles of breached existing levee to high-ground refuge habitat for small mammals and reptiles
- Purchase of new flood and conservation easements on agricultural land between the new weir and a point just downstream of the western railroad
- Retention of existing seasonal agriculture suitable for Swainson's hawk foraging habitat between the new weir and a point just downstream of the western railroad
- Restoration of riparian habitat within the existing Paradise Cut footprint from the eastern railroad track to the vicinity of the Old River confluence, about 6.1 miles of varying width
- Restoration of native grassland habitat within the channel between the existing rock weir and the eastern railroad, approximately 0.65 miles

- Restoration of shaded riverine aquatic habitat along the left bank of the mainstem San Joaquin River between the existing and proposed weirs, approximately 2.7 miles

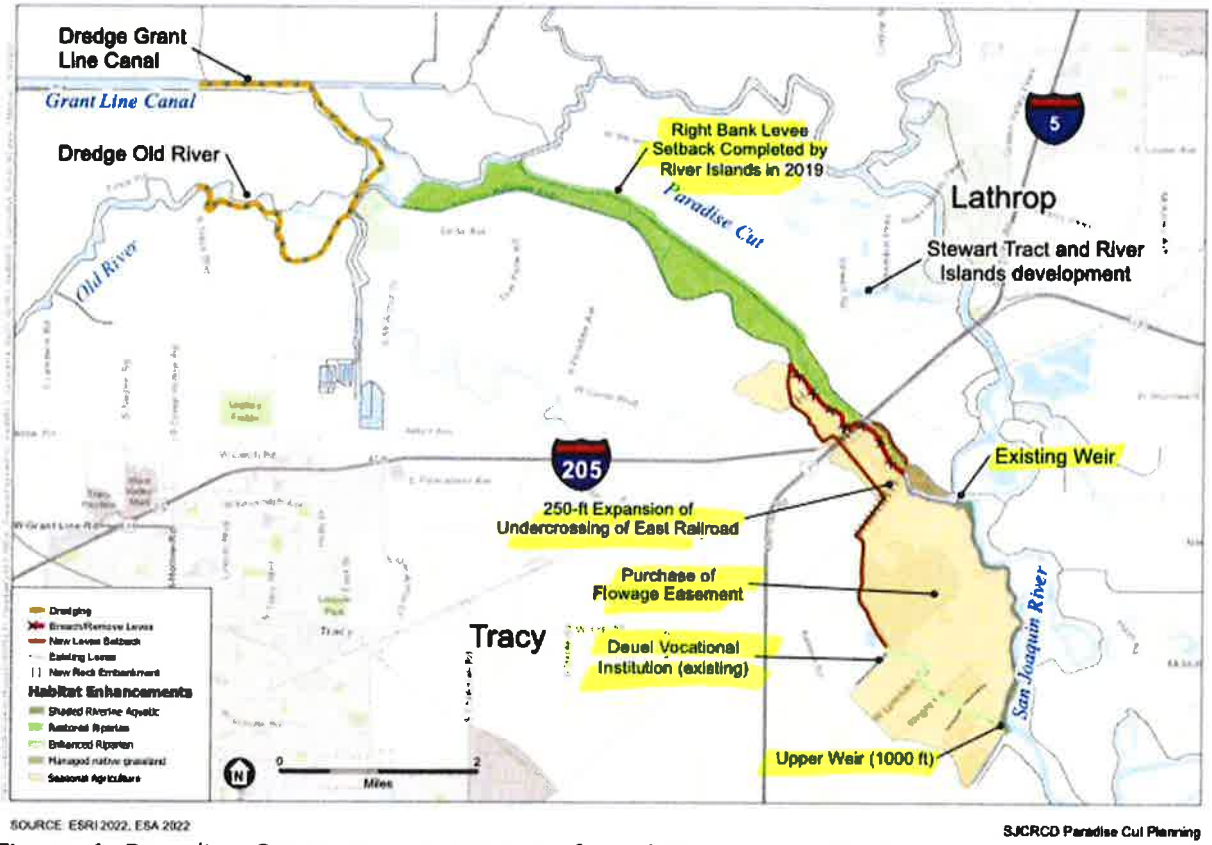

Figure 1. Paradise Cut Project in 2019 Preferred Conceptual Design.

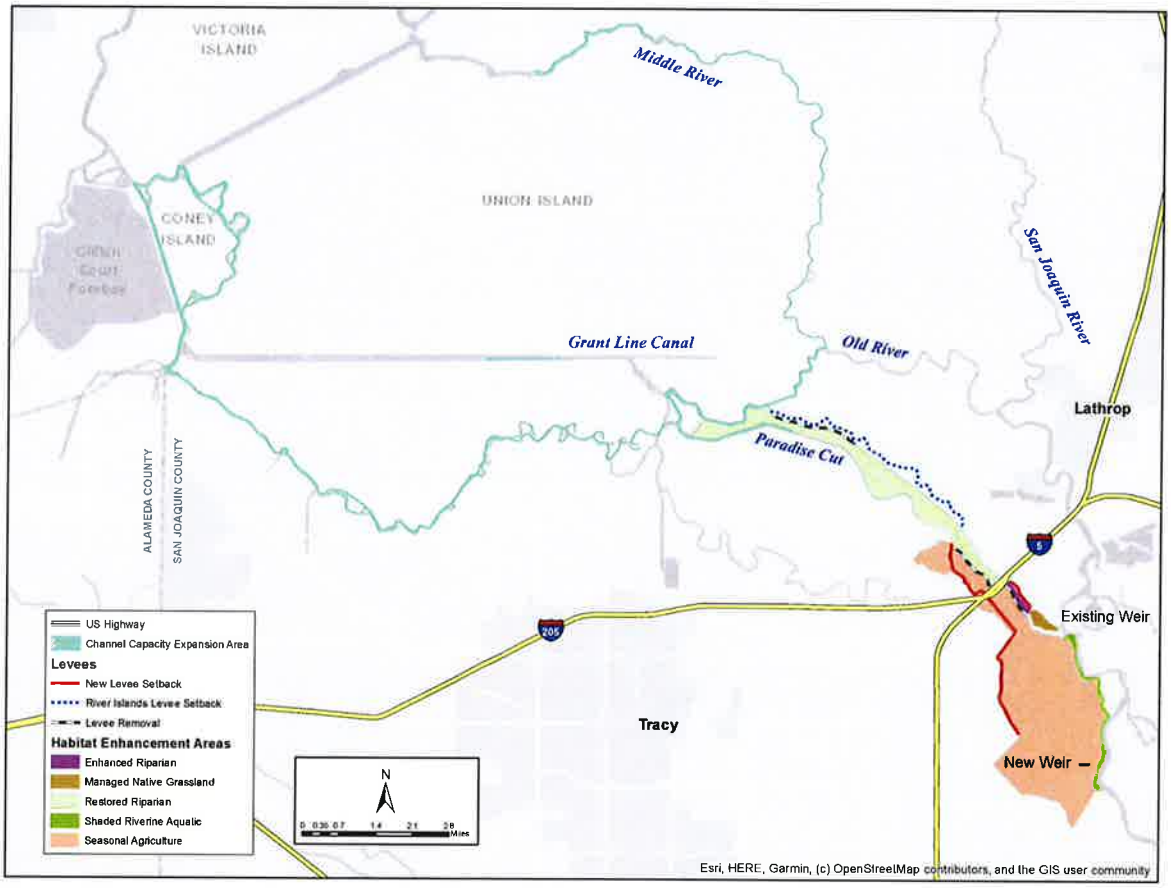

Figure 2. Paradise Cut Project with additional channel capacity expansion (dredging) recommended in the 2021 Anchor report.

ESA ANALYSIS OF DOWNSTREAM IMPACTS

The RCD is seeking feedback on ESA's evaluation of downstream impacts from the proposed Project (Attachment A), which is based on accuracy of five U.S. Army Corps of Engineers index points reflecting the condition of levees downstream of the Project that are intended to represent large lengths of leveed systems operated and maintained by several reclamation districts. The RCD is interested in whether these index points are accurate and if not, the studies or other work needed to ensure accuracy. These index points currently indicate potentially significant downstream hydraulic impacts from the proposed Project, although SJAFCA will conduct further analysis to verify the potential impacts. The RCD is also interested in other comments on ESA's analysis.

ESA's analysis is based upon hydraulic modeling results developed by MBK Engineers in 2019. Those results showed the water surface elevations and flow levels expected to result from the Preferred Conceptual Design, which included all of the Project features identified above except that it included five miles of dredging to two-foot depths, rather

than the larger dredging program indicated above. The ESA analysis uses these hydraulic modeling results to assess the potential for increase in three categories of levee failure risk: seepage, erosion, and overtopping. These failure risks are assessed using levee performance curves developed for each of the three failure modes by the California Department of Water Resources at the five index points representing South Delta levees.

The ESA analysis indicates that there is potential risk of seepage- or erosion-induced levee failure in certain locations downstream of the Project under the current-day 100-year flood scenario. There would likely be escalation of the risk of through-seepage and under-seepage at the three index points near the western end of Stewart Tract, in particular. The risk of overtopping of downstream levees is minimal under the current-day 100-year flood scenario.

At this time, it is unknown to what degree levee inspections have been conducted and documented by the reclamation districts, the US Army Corps of Engineers, or others, but it is critical to solicit this information and identify areas where additional geotechnical assessments could improve understanding and confidence in levee performance. More refined hydraulic modeling, sediment modeling, and more detailed geotechnical investigations are all necessary for potential impacts and avoidance strategies to be better specified in future phases of planning and engineering design.

STRATEGY AREAS

The RCD is seeking feedback on the following three strategy areas to address concerns with downstream impacts from the Project: 1) channel depth restoration and capacity expansion, 2) downstream flood risk reduction, and 3) habitat restoration. The three strategy areas are described in more detail below:

1) Channel Depth Restoration and Capacity Expansion

The Preferred Conceptual Design for the Project includes a proposal to restore channel capacity along approximately five miles of Old River and Grant Line Canal, including dredging of about two feet in depth. The Anchor report further analyzes additional dredging opportunities for the restoration of channel capacity in approximately 25 miles of southern Delta channels, which includes the five miles of channels in the Preferred Conceptual Design.

The RCD seeks feedback on how this expanded dredging proposal in the Anchor report decreases hydraulic impacts from the Project, including the interest to conduct

additional studies and modeling to determine the extent to which the expanded dredging will affect stage under high flow events and if additional dredging would further affect stage.

Increases in stage within Paradise Cut are an intended function of the Project, which moves floodwater off the mainstem San Joaquin River and into Paradise Cut in order to reduce flood risks to the urbanized areas of Lathrop, Manteca, and Stockton. The hydraulic model of the Preferred Conceptual Design's potential performance under the 1997 flood (similar to the current-day 100-year flood scenario) shows stage within Paradise Cut increasing by as much as two feet just upstream of the I-5 underpass, about six inches at the downstream end of Paradise Cut, and about six to eight inches in Old River and Grant Line Canal downstream of the Project.

These stage estimations already account for the effects of the dredging included in the Preferred Conceptual Design (five miles to two-foot depth) but not any additional dredging. The hydraulic analysis indicated that stage in Old River and Grant Line Canal would be about 1.5 – 2.0 inches higher if dredging had not been included in the Preferred Conceptual Design. While additional dredging may reduce stage further, there is not necessarily a direct or linear relationship between dredging quantity and stage under high flow scenarios due to 1) backwater conditions created by tides and downstream hydraulic constraints, and 2) the lower "relative roughness" of river and canal boundaries to the amount of water within them. Further detailed hydraulic modeling is required to assess the potential effects of additional dredging on stage under various scenarios, including those representing the much larger flood flows that will become more frequent under anticipated climate change.

Although the dredging identified in the Project does make some contribution to reducing peak flood stages downstream of Paradise Cut, its primary benefit to the Project is in the restoration of historic channel depths for the benefit of water supply and aquatic habitat. Additional dredging may not mitigate hydraulic impacts and levee failure risks to downstream landowners as effectively as other potential hydraulic impact mitigation strategies, so additional dredging in the Project should be considered and analyzed primarily in light of its channel restoration benefits rather than solely as a potential hydraulic impact mitigation measure.

2) Downstream Flood Risk Reduction

The RCD is interested in learning more about opportunities to reduce flood risk and hydraulic impacts downstream of the Project, which include strategies to improve downstream levees. At the public workshop, the RCD and ESA will seek feedback from reclamation districts on specific ideas to help address downstream impacts from the Project. ESA and Partners have identified eight strategies to date, which are discussed in more detail below, including:

a) using dredge spoils to improve downstream levees
b) integrating ecological levee rehabilitation elements into levee improvements and maintenance
c) setting back levees to decrease flood risk
d) reconnecting and restoring floodplains to decrease sediment
e) decreasing levee erosion using vegetation
f) stabilizing levees with riprap
g) decreasing levee seepage with cutoff walls and seepage berms
h) monitoring and maintaining levees.

At this early stage of the Project, it is uncertain whether the lead agency will need to include additional design measures in the Project to counter negative hydraulic impacts. Most risk reduction strategies are dependent upon the outcome of more detailed geotechnical and hydraulic analysis of the Project.

Local reclamation districts know their levees best, so the RCD is interested in proposed levee improvement projects and other strategies that will specifically address concerns with downstream impacts from the Project. The RCD may recommend high priority levee improvement projects for SJAFCA to consider in the feasibility study. The following includes some potential strategies to reduce downstream flood risk:

a) Improving Downstream Levees with Dredging Spoils

According to the Anchor report, there isn't any evidence of sediment contamination that would rule out the potential use of dredge spoils for levee improvements. In addition, finding an efficient use of dredging spoils near the site of excavation could decrease projects costs since transport of soils is so expensive. The RCD is seeking feedback from reclamation districts on specific projects that would use dredging spoils to help address downstream impacts from the Project.

b) Using Ecological Levee Rehabilitation or "Green Levees" to Decrease Flood Risk

The RCD is interested in the potential for downstream reclamation districts to integrate ecological levee rehabilitation or "green levee" strategies, including setback levees, into either proposed levee improvements or ongoing levee maintenance efforts. The RCD is seeking feedback from reclamation districts on opportunities to integrate green levees to help address downstream impacts from the Project. The integration of such features into the Project will increase the attractiveness of the Project to agencies interested in funding multi-benefit flood protection projects.

Green levee strategies may be similar to those developed by Reclamation District 1601 and KSN on Twitchell Island in the Central Delta (**Figure 3**), which involve:

1. Using dredge spoils (if geotechnically appropriate) to widen the levee cross section by creating toe berms and/or seepage berms behind existing levees to reduce the probability of failure, as well as to provide a foundation for constructing a new setback levee.
2. Building a new setback levee behind the existing levee with appropriate freeboard, slope, and geotechnical characteristics to avoid erosion, seepage, and overtopping hazards. The setback levee can be built as a traditional trapezoidal levee or as a terraced structure that could enable planting of trees and vegetation at the base of the waterside of the levee without reducing flood protection.
3. Planting of trees and other vegetation on at least one slope of the original levee.
4. Breaching of original levees in multiple locations to permit water to flow in and create aquatic habitat between the original levee and the setback levee. This backchannel in between the levees can be designed to be wet year-round or only at selected times of high flow, depending upon the ecosystem restoration objectives.
5. Maturing vegetation over time to create riparian and shaded riparian aquatic habitat within and alongside the backchannel.

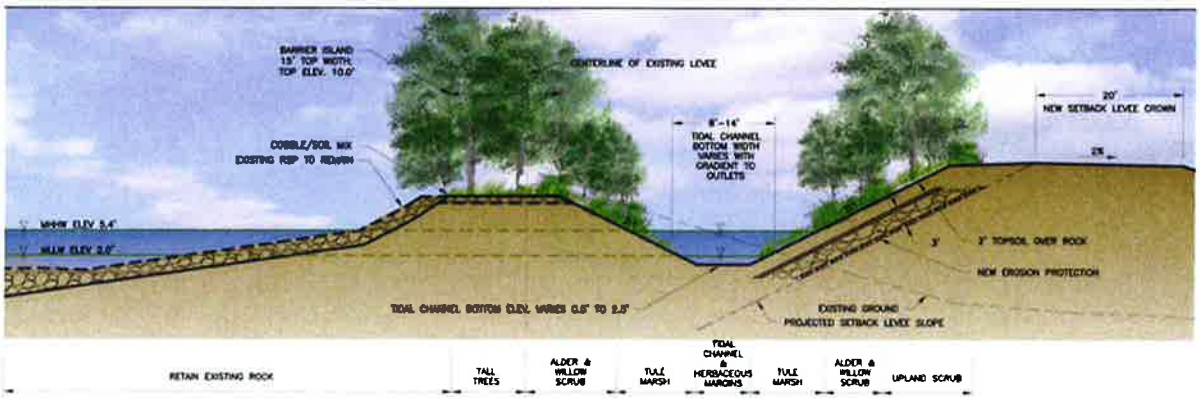

Figure 3. Example of ecological levee strategy with setback levee, wide islands, and discontinuous back channels (KSN, Inc.).

These integrative green levee strategies offer a number of potential advantages, including creation of significant new habitat areas, expansion of overall channel capacity, and (depending upon design) protection against multiple modes of levee failure. If dredged spoils are found to be geotechnically suitable, this strategy would also provide an opportunity for placement and reuse of these spoils within the Project area, thereby avoiding the expense and environmental impact of off-site disposal. The types of habitat potentially created (especially shaded riparian aquatic) may also provide additional mitigation capacity for the impacts of other levee construction and rehabilitation projects elsewhere in the Lower San Joaquin River region.

Green levees would likely be most suitable in areas where significant channel widening and ecosystem restoration are feasible. Given the extensive earthmoving and vegetation planting involved, they are likely to be relatively expensive on a per-mile basis compared to other strategies, but also could bring multiple benefits (and avoided costs of dredge spoil disposal) that may partially or completely counterbalance the relatively high construction costs compared to other strategies.

Based on what is known at the present time, the green levee strategies may be best suited for consideration in the vicinity of the confluence of Paradise Cut and Old River (as represented by Index Points 30, 31 and 40 (**Figure 4**)), due to the following general characteristics of this area:

- Relatively large increase in failure risk of existing levees from the hydraulic impacts of the Project (as shown in Appendix A, "Evaluation of Seepage and Erosion Failure Risks")

- Greater distance between ecosystem restoration areas and the State and Federal Water Project pumping facilities, compared to sites further west
- Slightly higher elevation above tidal zone, compared to sites further west

Figure 4. Index points on and downstream of Paradise Cut evaluated by the USACE for levee performance. Index points are intended to represent large lengths of leveed systems operated and maintained by several reclamation districts.

c) Setting Back Levees to Decrease Flood Risk

The green levee strategy identified above is a specialized case of the more general strategy of setback levees. Setting back levees can meet flood risk management objectives by expanding channel capacity while also restoring floodplain habitat and improving ecosystem processes. Setback levees may or may not involve complete removal of existing levees; often existing levees are breached, but not removed, in order to reduce earthmoving costs and to provide areas of high ground during high-flow events. At least two breaches are generally necessary in order to ensure proper passage of flows and to avoid fish stranding hazards. Setback levees can also incorporate side channels or other features specifically designed to enhance habitat quality.

Setback levees do not necessarily require the removal of agriculture from the floodplain. There are other locations in the lower San Joaquin Valley where agriculture occurs on the waterside of levees and is subject to periodic but infrequent flooding. Flowage easements, insurance, or other financial and legal strategies could be used to ensure the continued economic viability of floodplain

agriculture in situations where existing agricultural lands were exposed to periodic but infrequent flow events.

Setback levees provide more channel capacity to convey flows and therefore generally reduce flood risks to adjacent lands. However, their ability to do so may also be limited by other constraints, such as flow bottlenecks, that ultimately determine how much water can pass through a given reach in a given amount of time. Conversely, the removal or relaxation of such bottlenecks may require expansion of downstream channel capacity to ensure continued safe passage of flows.

These considerations are important for Paradise Cut in light of the larger flood flows that are expected on the San Joaquin River under climate change scenarios. Existing hydraulic analyses assess the performance of the Preferred Conceptual Design under current hydrology, including the 1997 flood, which is similar to the 100-year flood under current hydrology. Safe conveyance of the substantially larger flows anticipated under climate change through Paradise Cut may require both the expansion of current bottlenecks (such as the railroad and freeway undercrossings) and the expansion of channel capacity through setback levees.

Projects that incorporate nature-based solutions such as setback levees are currently more competitive for grant funding. In addition, the increased flood risk under future climate scenarios may favor nature-based solutions like setback levees that may deliver multiple benefits in a more financially efficient manner in the long run. A comprehensive benefit-cost analysis is required to acknowledge and account for the multiple social, environmental, and economic benefits of setback levees.

d) Reconnecting and Restoring Floodplains to Decrease Sediment

Sedimentation in Paradise Cut and other South Delta channels is a complex phenomenon that may be related both to periodic San Joaquin River flows through Paradise Cut and to tidal and other hydraulic dynamics in the South Delta. There are no sediment transport models of the lower San Joaquin River, so little is known about the extent of deposition resulting from periodic flows from the San Joaquin River over the existing Paradise Cut weir, or about what levels of sedimentation could be expected from the Project and where deposition would occur in various flow scenarios.

If future investigations show that the Project would result in additional sedimentation of South Delta channels, there is potential for this to be addressed

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(at least partially) through the reconnection of floodplains where sediment can be deposited in high flow situations. Generally, sediment deposition occurs most readily in areas where the velocity of flow is slowing down. In areas where levee setbacks are possible, channels could be re-profiled and/or floodplains could be graded and replanted to promote more frequent floodplain inundation and overbank deposition of sediment. The area of flowage easements downstream of the new weir could also become a site of sediment deposition, depending upon flow dynamics. More analysis is required to determine if sedimentation issues exist, and if so, where changes in channel and floodplain geometry may prove helpful.

Floodplain restoration is considered a nature-based solution that could meet flood risk management objectives while improving geomorphic processes and providing ecological uplift. Projects that incorporate nature-based solutions are also more competitive for grant funding.

e) Decreasing Levee Erosion Using Vegetation

A variety of materials could be applied to channel banks or levee slopes to address erosion concerns. For the range of average velocities that are estimated under the 1997 flood scenario (7 ft/s or less on all drainages), numerous vegetation-based, rolled erosion control products, and/or soil bioengineering measures could apply (two options are illustrated in **Figures 5-6**). These types of measures could be selected over rock slope protection and hardscaping to promote vegetative growth and more suitable habitat conditions. In the past, the US Army Corps of Engineers (USACE) has generally not allowed the intentional planting of vegetation on levees that are part of federal flood control projects, which in this case includes the levees running along the left bank of Paradise Cut to the Old River confluence and along the right bank of Paradise Cut and then Old River until its confluence with Grant Line Canal. Any strategy to vegetate levees in this reach would have to be developed in close consultation with USACE. Levees further downstream of Paradise Cut (e.g. along Doughty Cut, Grant Line Canal, and Old River west of its confluence with the southern channel of Paradise Cut) are not subject to USACE rules in this regard.

Vegetated levees are considered a nature-based solution that could meet flood risk management objectives while improving geomorphic processes and providing ecological uplift. Projects that incorporate nature-based solutions are also more competitive for grant funding.

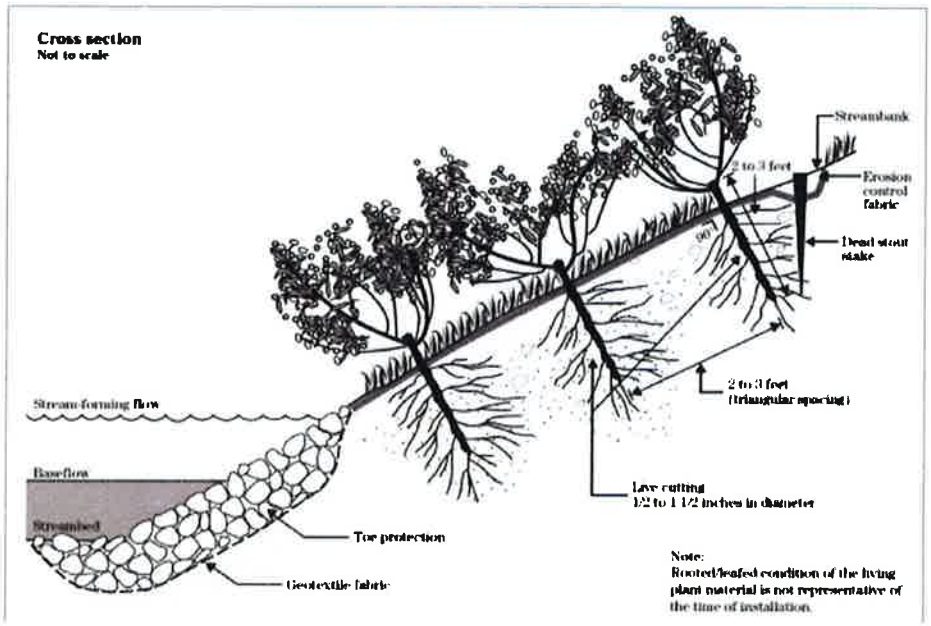


Figure 5. Decreasing erosion on levees using fabric cover over soil and live stake plantings.

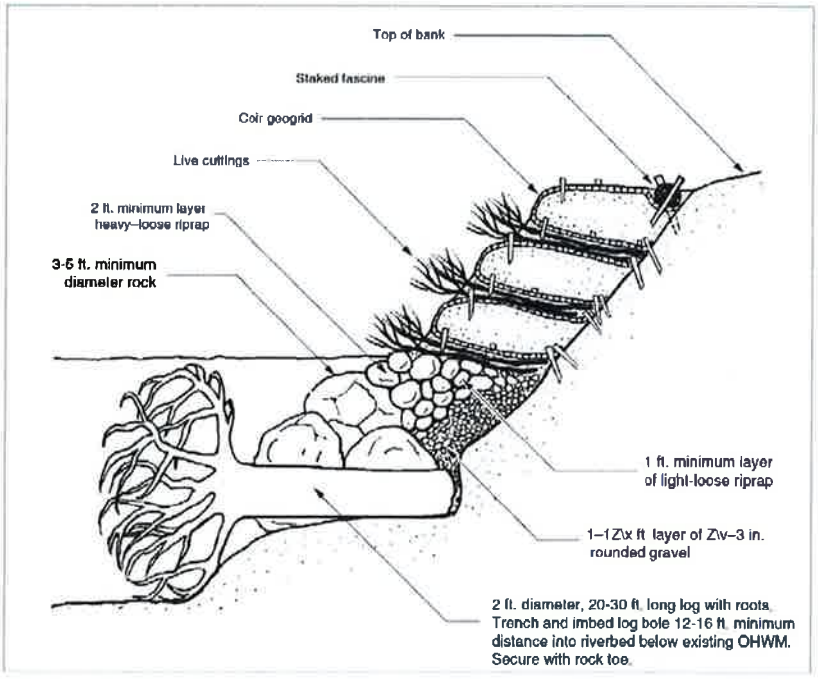


Figure 6. Decreasing erosion on levees using vegetated soil lifts (or geogrids)

f) Stabilizing Levees With Riprap

One strategy to stabilize levees is placing riprap (or quarry stone or rock slope protection) along the levee toe to stabilize the bank during a flood and prevent

slipping and failure of the levee surface as water surface elevations recede. This is a common strategy for protection against erosion but has major ecological disadvantages, as it discourages the establishment of vegetation that provides riparian habitat and provides food sources and shade for fish and other aquatic organisms. Placement of new riprap where it has not previously existed will create environmental impacts that would likely require mitigation.

g) Decreasing Levee Seepage With Cutoff Walls and Seepage Berms

One anti-seepage strategy is cutoff walls, which create a physical barrier to seepage through the center of the levee down to competent, non-permeable materials below the levee foundation (**Figure 7**). Another strategy is the use of seepage berms along the landside toe of the levee, which helps to stabilize the levee toe and prevents upwelling of water and piping from under-seepage (**Figure 7**). Through-seepage and under-seepage are significant modes of failure for levees near the western end of Stewart Tract (SJ30, SJ31b, and SJ40 (**Figure 4**)).

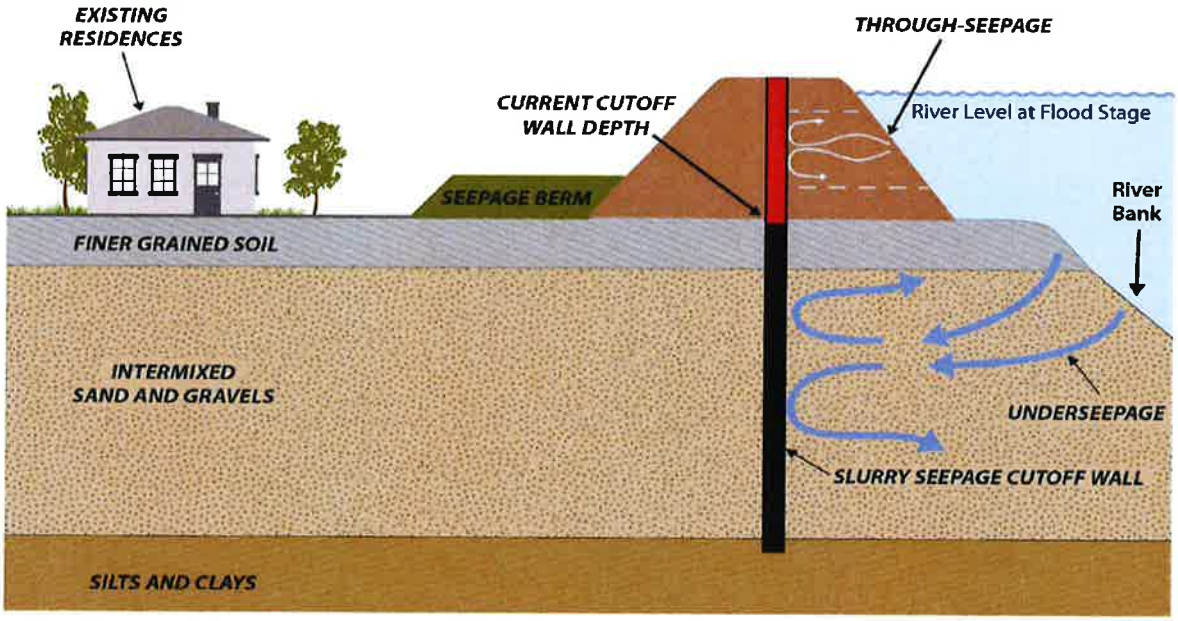


Figure 7. Diagram of cutoff walls and seepage berms to protect levees from through seepage and under seepage.

h) Monitoring and Maintaining Levees

Hydraulic impacts that result in a relatively minor increase in the probability of failure may not require additional physical design measures to address those impacts. In those instances, monitoring and maintenance measures to counteract those hydraulic impacts may prove more cost effective in the long run.

3) Habitat Restoration

The RCD has developed a list of conceptual "add on" habitat restoration projects which SJAFCA could consider including in the proposed Project. The Project currently includes significant habitat restoration by reestablishing many miles of shallow water habitat, so that these add-on projects would further increase the environmental benefits of the Project. The RCD seeks feedback on including the following habitat restoration projects in the Project:

(a) Hyacinth/Egeria Removal

The RCD recommends removing water hyacinth (*Eichhornia crassipes*) and curly leaf pondweed (*Egeria densa*), two invasive non-native aquatic plants that clog Delta waterways, as part of developing the Project. The dredging proposed as part of the Project will help increase channel capacity, increase shallow water habitat, and remove water hyacinth and *Egeria densa*. Increased channel depth may inhibit future growth of water hyacinth and *Egeria densa*.

+10' IN DEPTH THRU

(b) Salmon Slough Restoration

The RCD proposes to re-establish Salmon Slough as functioning waterway/habitat with a potential control structure to help improve water quality (**Figure 8**). Salmon Slough is currently choked with non-native vegetation, silt, and trash, which adversely affect channel habitat. The non-native vegetation and accumulated silt prevent any meaningful flow in the Slough except during times of high flow. Removing vegetation from Salmon Slough will allow for restoration of habitat and regular, increased flows from the tides. These increased flows also should improve local water quality.

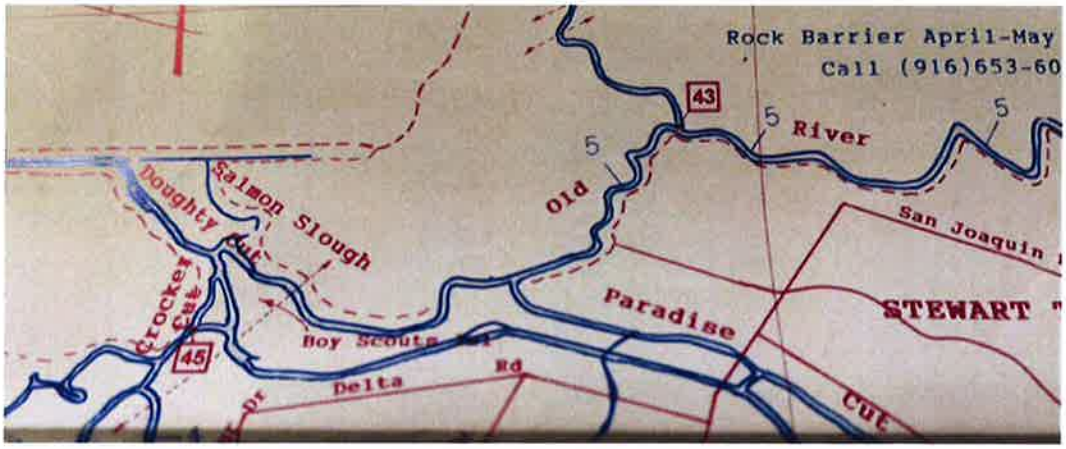


Figure 8. Salmon Slough at Doughty Cut downstream of Paradise Cut.

(c) 100-Acre Interior Channel Island Restoration

An interior channel island, of approximately 100 acres, located next to the Project is an ideal location to deposit dredging spoils and restore habitat for terrestrial and aquatic species. The RCD proposes that SJAFCA work with the wildlife agencies and the San Joaquin Council of Governments (SJCOG) to develop a habitat restoration project on the island as part of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP).

(d) Grant Line Canal Habitat Restoration

The RCD recommends exploring opportunities to improve habitat for native terrestrial and aquatic species along the southern border of Grant Line Canal from the Tracy Road Bridge to Doughty Cut, an area which does not currently benefit from tidal flows because of non-native vegetation and accumulated silt. The RCD proposes working with the wildlife agencies and the SJCOG to transform this area into valuable shallow water or other habitat with tidal flows as part of the SJMSCP. This project also would improve local water quality.

(e) Grant Line Canal/Fabian Bell Canal Channel Islands Preservation

The channel islands between Grant Line Canal and Fabian Bell Canal erode as a result of high flows. The RCD suggests exploring the use of dredging spoils or other means to enhance and protect the valuable habitat on these islands.

(f) Paradise Cut Habitat Enhancement

Paradise Cut is currently a dead-end slough unless the flows on the San Joaquin River reach approximately 17,000 cfs. The RCD recommends working with the wildlife agencies and the SJCOG to explore altering Paradise Cut to allow tidal and river flows to freely move through the channel to achieve the twin goals of improving habitat and local water quality and advancing the goals of the SJMSCP.

(g) Old River/Middle River Channel Island Preservation

Protect and, as possible, improve habitats on various channel islands in Old River and Middle River. Old River and, to a lesser extent, Middle River also contain many small channel islands, which are subject to erosion during high flow events. Many of these islands could be protected from such erosion and their habitat value improved and maintained.

(h) Tom Paine Slough Habitat Enhancement Project

The RCD recommends exploring opportunities to manage and maximize habitat associated with remnants of upper Tom Paine Slough. The upper reaches of Tom Paine Slough provide distinct and important habitats separate from those along and in the main Delta channels. The RCD recommends working with the wildlife agencies and the SJCOG to explore opportunities to protect and maintain this habitat as part of the Project and the SJMSCP, as well as provide additional flood protection for local farmers.

CONCLUSION

At the forthcoming public workshop, the RCD will request feedback on the ESA analysis of potential downstream impacts of the Project (Attachment A), as well as the strategies identified above to address concerns with downstream impacts from the Project. The feasibility study (beginning in 2023) will examine alternative configurations of the Project and determine whether strategies to address concerns with downstream impacts that the RCD recommends to SJAFCA as part of this process are ultimately included in the Project. Local acceptance and consistency with regional and state policy goals are both necessary for the ultimate success of the Project, so input received now through the public workshop and other means will help shape the alternatives and impact avoidance strategies considered in the feasibility study, and the ultimate configuration of the Project.

APPENDIX A

memorandum

date	February 14, 2023
to	Krista McCoon, San Joaquin County Resource Conservation District
from	Bill Eisenstein and Brian Haines, ESA
subject	Paradise Cut Expansion and South Delta Restoration Project Avoidance, Mitigation, Monitoring, and Maintenance Strategies

This memo provides a description of potential hydraulic impacts of the Paradise Cut Expansion and South Delta Restoration Project (Project) on downstream areas. A more complete assessment of the Project's potential overall environmental impacts will be available in a full-length report from which this memo's findings are excerpted.

Key findings related to potential hydraulic impacts downstream of the Project are summarized as follows:

- The current preliminary evaluation of engineering and design impacts was based on existing geotechnical assessments for five index points that are intended to represent large lengths of leveed systems operated and maintained by several reclamation districts. Additional information about the characteristics of downstream levees from local reclamation districts, property owners, the US Army Corps of Engineers, and geotechnical investigators is of critical importance to the refinement of these analyses and to the eventual engineering design and planning of the Project.
- Analysis based on the five index points indicates that there is potential risk of seepage- or erosion-induced levee failure in certain locations downstream of the Project under the approximate current-day 100-year flood scenario.
- The levee performance curves and hazard ratings for the five index points show that through-seepage and under-seepage are significant modes of failure for levees directly downstream of Paradise Cut.
- Generally, the risk of overtopping of downstream levees is minimal under the approximate current-day 100-year flood scenario.
- Refined hydraulic modeling is recommended to estimate more precisely the velocities and shear stresses acting on the channel boundary.
- Additional investigation is needed to assess the potential for additional sedimentation of downstream channels as a result of the Project.
- Recent climate scenarios developed for the 2022 Update of the Central Valley Flood Protection Plan should be incorporated into all future analyses to account for potential changes to inland hydrology and sea levels and improve the long-term resilience of the Project.

The above findings already incorporate the assumption of five miles of channel dredging in Old River and Grant Line Canal to a depth of 2 feet, which is a specified feature of the Project. The San Joaquin Area Flood Control Agency (SJAFCA) will be the project lead agency for the upcoming feasibility study and may consider adding more dredging to the project in the area analyzed in the 2021 Anchor QEA report commissioned by the South Delta Water Agency. Although the dredging identified in the Project does make some contribution to reducing peak flood stages downstream of Paradise Cut, its primary benefit to the Project is in the restoration of historic channel depths for the benefit of water supply and aquatic habitat. Additional dredging may not mitigate hydraulic impacts and levee failure risks to downstream landowners as effectively as other potential hydraulic impact mitigation strategies, so additional dredging in the Project should be considered and analyzed primarily in light of its channel restoration benefits rather than solely as a potential hydraulic impact mitigation measure.

Analysis of the potential environmental impacts of the Project indicates the Project, as currently defined, is likely to be self-mitigating with respect to species and habitat impacts, with the possible exception of impacts to freshwater wetlands that may occur depending upon the precise alignment of future setback levees. A range of avoidance, mitigation, maintenance, and monitoring strategies will likely be needed to address potential environmental impacts.

Potential Negative Hydraulic Impacts Evaluations

Interested parties have expressed concerns regarding the Project's potential for negative hydraulic impacts on downstream landowners and reclamation districts. This section will discuss the potential for changes in hydraulic conditions to impact the performance of the channels (rivers and canals) and structures (levees, weirs, etc.) that comprise the flood management system. These potential impacts fall into three categories, each of which are discussed below:

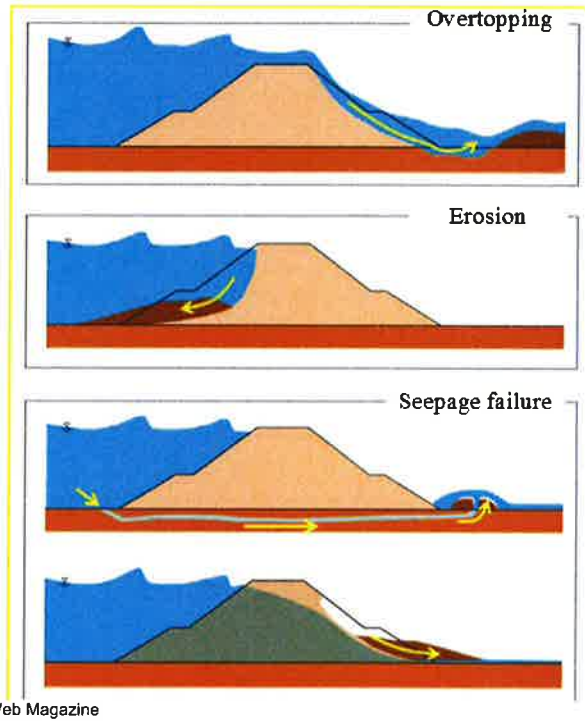
- Potential for increased risk of levee failure due to higher water surface elevations
- Potential erosion of channel edges due to increased velocity of flows through the channel
- Potential sedimentation within the channel due to increased flows through the channel

Evaluation of Levee Failure Risk

Leveed systems are subject to increased hydraulic forces during flood events, leading to one of three possible modes of levee failure: seepage, erosion, or overtopping (**Figure 1**).

- **Seepage failure** occurs when increases in flood stage exert additional pressure on a levee and result in increased seepage of water through the levee or underneath the levee, known as through-seepage and under-seepage, respectively. Seepage through the levee or foundation creates preferential flow paths and piping of water through the soils, which leads to internal erosion and geotechnical failure. Additional water within the soils of the levee can also increase the specific weight of materials, create geotechnical instabilities, and result in failures of the levee slope.
- **Erosion failure** occurs when increases in flood stage result in deterioration of the waterside face of the levee.
- **Overtopping failure** occurs when increases in flood stage that exceed the levee crest result in overtopping of the levee, erosion of the landside levee face, and breaching of the levee.

An initial assessment of the potential for each of these failure modes to occur because of the Project is presented below.



SOURCE: PWRI Web Magazine

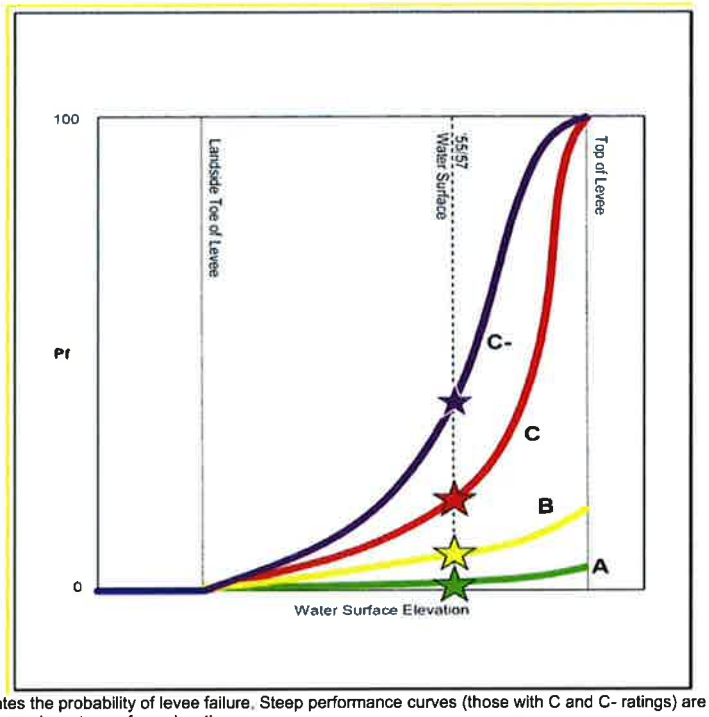
Figure 1
Schematic Illustration of Modes of Levee Failure

Evaluation of Seepage and Erosion Failure Risks

As part of the 2017 update to the CVFPP, DWR developed a series of levee performance curves to support the economic modeling of planned flood risk reduction measures (URS 2015). Levee performance curves were developed for each mode of levee failure (e.g., through-seepage) at a series of index points. The mode-specific performance curves were compiled into a cumulative curve at each index point to understand the overall probability of levee failure with increasing water surface elevations (**Figure 2**).

Levee performance curves are based on two parameters: the elevation of water against the levee relative to the landside toe of the levee and the probability of failure (Pf). As water surface elevations increase, so does the probability of failure as more forces act on the levee. Levees built to modern design standards are less sensitive to an increase in water surface elevations. In other words, as water surface elevations rise there is a minor increase in the probability of failure. In contrast, levees with poor performance characteristics are more sensitive to increases in water surface elevations, which can result in a significant increase in the probability of failure.

For the CVFPP economic modeling effort, levees were graded on their historic or perceived future performance. Highly resilient levees were given an "A" rating, while the worst performing levees were given a "C-". Figure 2 illustrates the range of performance curves and associated "hazard" ratings.



NOTE: Pf indicates the probability of levee failure. Steep performance curves (those with C and C- ratings) are more sensitive to changes in water surface elevations.

Figure 2
An Example of Levee Performance Curves and Associated Hazard Ratings (A through C-)

Index points are horizontal coordinates used to represent portions of levee systems evaluated as part of the CVFPP. Each index point was assigned a cumulative levee performance curve and hazard ratings for each of the four primary modes of levee failure. Five index points are located at the western end or downstream of Stewart Tract (**Figure 3**). Two of the index points are within Paradise Cut (SJ30 and SJ31b), two are associated with Old River (SJ40 and SJ42), and one is along the southern levee of Grant Line Canal (SJ41).

Figure 3
Index Points Located Downstream of Paradise Cut

The quality of levee performance data varies between the index points. Index points near Paradise Cut (SJ30, SJ31, and SJ40) have poor performance ratings for erosion and seepage-based modes of failure (**Figures 4-6**). As such, those performance curves are steeper and more sensitive to increases in water surface elevation. Performance curves further downstream on Grant Line Canal (SJ41) and Old River (SJ42) are less sensitive to increases in water surface elevations, but the individual hazard ratings and performance curves are based on limited data (LD) sources (**Figures 7 and 8**).

Although the 1997 flood scenario is considered the most realistic of the three hydrologic scenarios, the levee performance data were developed using water surface elevations associated with the original levee system design that dates back to 1955 or 1957 (the "Design" hydrologic scenario). Although the data have not been presented in this document, the maximum increase in the design water surface elevation under with-Project conditions is approximately 0.3 feet at the specified areas of interest: Paradise Cut, Grant Line Canal, and Old River (American Rivers 2019). Using this same 0.3-foot increase in water surface elevation for all locations allows for direct comparisons of sensitivity between levee performance curves and will help to identify areas that may require additional design measures to counteract negative hydraulic impacts.

The levee performance curves for the western end of Paradise Cut (SJ30 and SJ31b) are steep due to poor hazard ratings for erosion, through-seepage, and under-seepage modes of levee failure (Figures 4 and 5). At SJ30, a unit increase in the design water surface elevation increases the probability of levee failure by 19 percent. Similarly, a unit increase in water surface elevations at SJ31b (the levee opposite of SJ30) increases the probability of levee failure by 30 percent. Index point SJ40 is located on the right levee of Old River approximately 0.4 miles downstream of SJ30 and SJ31b. The SJ40 levee performance curve is very steep due to the very poor hazard ratings (C-) for erosion, through-seepage, and under-seepage. At this location, a unit increase in water surface elevations results in a 14 percent increase in the probability of failure.

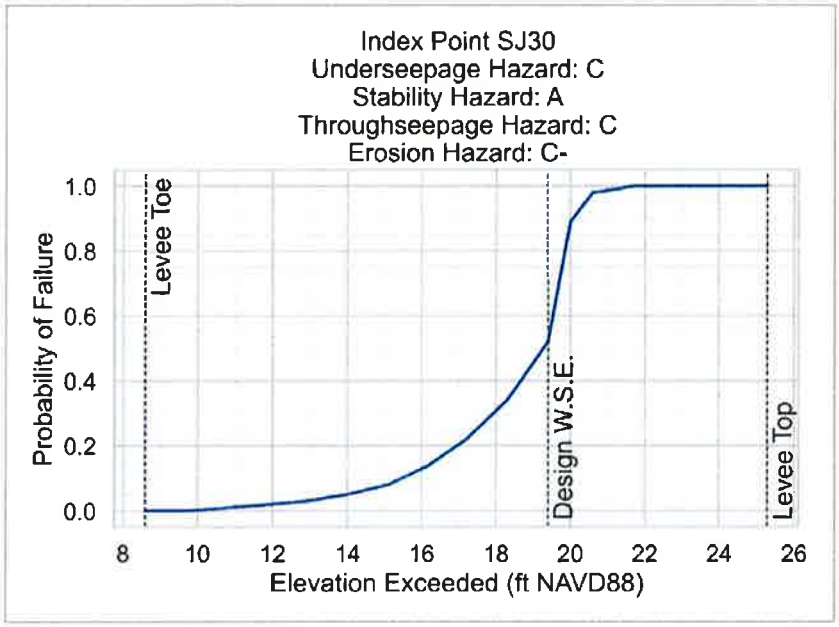


Figure 4
Levee Performance Curve for Index Point SJ30 Located on the Left Levee at the Western End of Paradise Cut

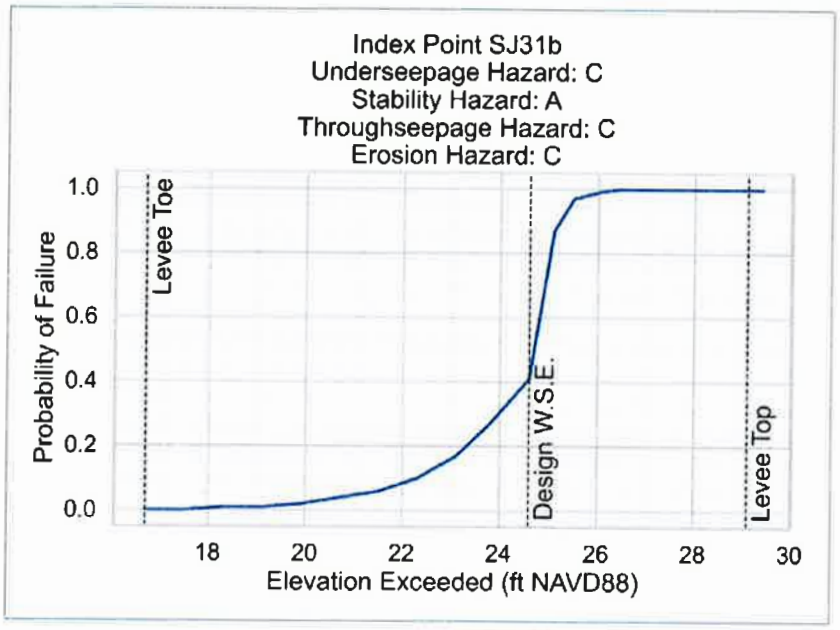


Figure 5
Levee Performance Curve for Index Point SJ31b Located on the Right Levee at the Western End of Paradise Cut

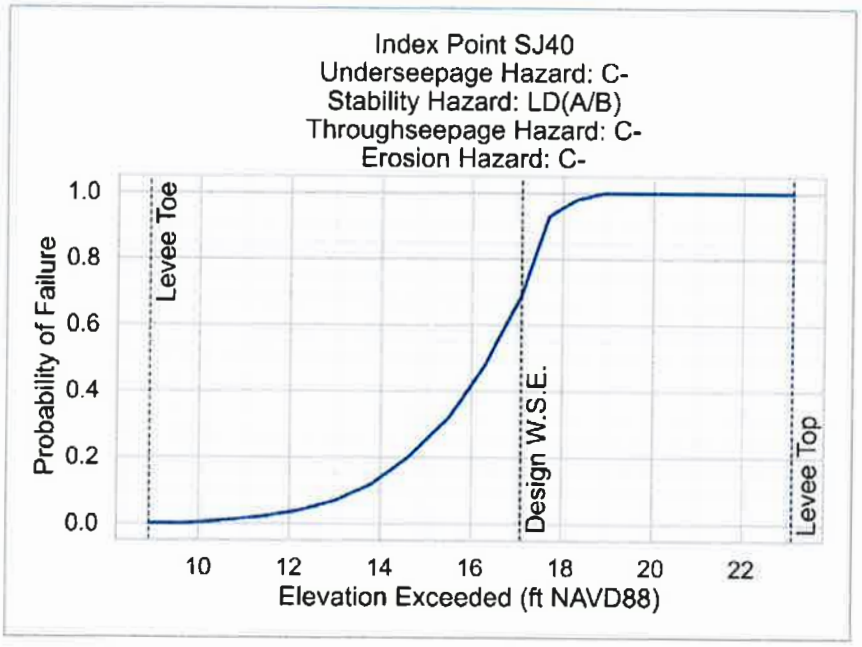


Figure 6
Levee Performance Curve for Index Point SJ40 Located on the Right Levee of Old River Just Downstream of the Paradise Cut

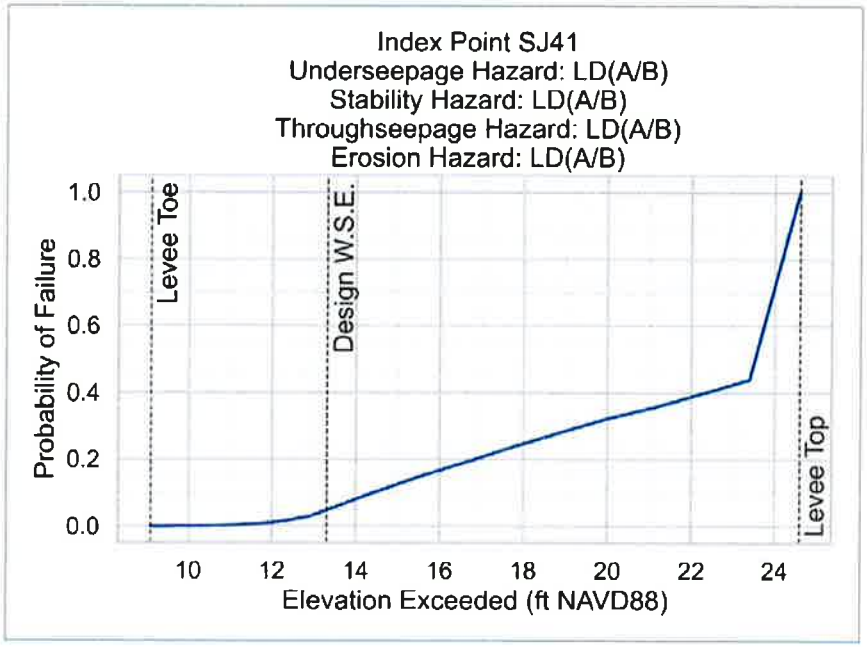


Figure 7
Levee Performance Curve for Index Point SJ41 Located on the Left Levee of Grant Line Canal

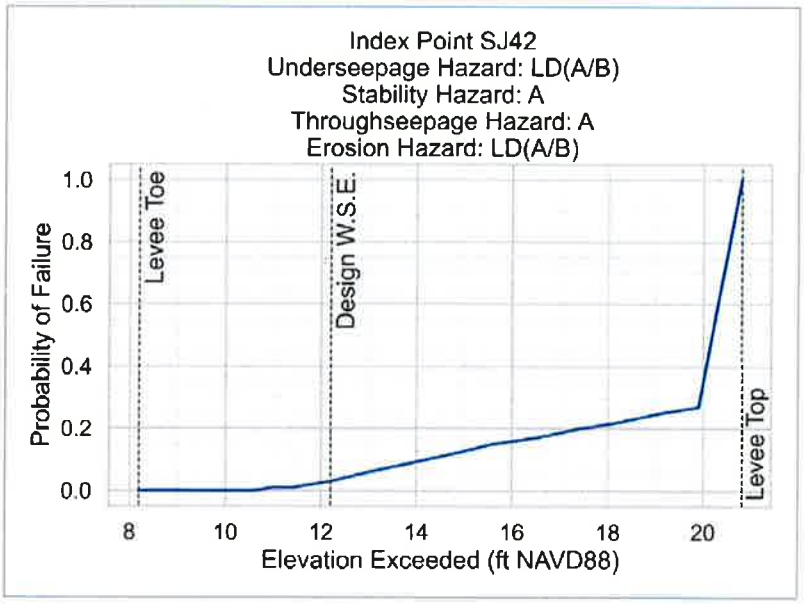


Figure 8
Levee Performance Curve for Index Point SJ42 Located on the Left Levee of Old River

The levee performance curves downstream of the Old River and Grant Line Canal split are poorly developed due to a lack of data but appear to be relatively insensitive to moderate changes in water surface elevations. The levee

performance curve at SJ41 (Figure 10) is less steep due to good ratings across all modes of levee failure (A/B). Due to the lack of data, these ratings are based on the professional judgement of an expert panel (URS 2015). The levee performance curve at SJ42 (Figure 11) is less steep than SJ41 due to the excellent ratings (A) for stability and through-seepage and good ratings (A/B) for erosion and under-seepage. A unit increase in water surface elevations at SJ41 or SJ42 results in a 2 percent increase in the probability of failure.

A summary of levee hazard ratings for each of the five index points and changes in the probability of failure due to a unit increase of 0.3 feet[1] in water surface elevations during the design flood scenario are provided in **Table 1** below. The data show that the probability of failure for three of the leveed systems (SJ30, SJ31b, and SJ40) increases from 14 to 30 percent under with-Project conditions. Two other leveed systems (SJ41 and SJ42) show a 2 percent increase in probability of failure, but also have hazard ratings based on limited geotechnical data. Overall, the five index points that have been discussed are not associated with significant stability hazards (all have an A or A/B rating), though stability hazard ratings for SJ40 and SJ41 are based on limited data at the present time.

TABLE 1
HAZARD RATINGS AND POTENTIAL CHANGES IN THE PROBABILITY OF FAILURE AT FIVE INDEX POINTS

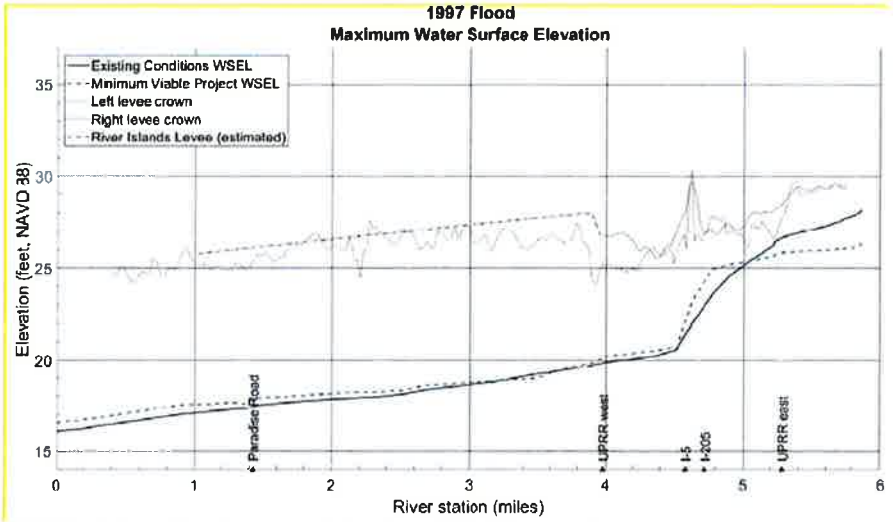
Index Point	River	Design WSE*	Hazard Rating[1]				Probability of Failure (Pf)		
			Erosion	Stability	Through-seepage	Under-seepage	DWSE	DWSE + 0.3 ft	Change in Pf
SJ30	Paradise Cut	19.3	C-	A	C	C	51%	70%	19%
SJ31b	Paradise Cut	24.6	C	A	C	C	40%	70%	30%
SJ40	Old River	17.1	C-	LD (A/B)	C-	C-	69%	83%	14%
SJ41	Grant Line	13.2	LD (A/B)	LD (A/B)	LD (A/B)	LD (A/B)	5%	7%	2%
SJ42	Old River	12.2	LD (A/B)	A	A	LD (A/B)	3%	5%	2%

NOTES:
* ft NAVD88
1 LD signifies "limited data"

Evaluation of Overtopping Failure Risk

A preliminary evaluation of overtopping potential under the 1997 flood scenario was conducted as part of American Rivers (2019). As shown in **Figure 9**, all increases in stage under the with-Project condition are well within the existing freeboard of the levee system. "Freeboard" is the amount of vertical distance between the water surface elevation at a given design flow and the top of the levees. A commonly used flood engineering standard is to maintain at least 2 feet of freeboard. At one location inside the Project area (near the I-205 crossing), the modeled stage elevations in Figure 2 would reduce freeboard to slightly below 2 feet, an issue that the lead agency should address in the eventual engineering design of the Project. In all areas west of the Union Pacific Railroad (UPRR), freeboard is far above 2 feet under the modeled flow and therefore the flows do not pose any overtopping hazard.

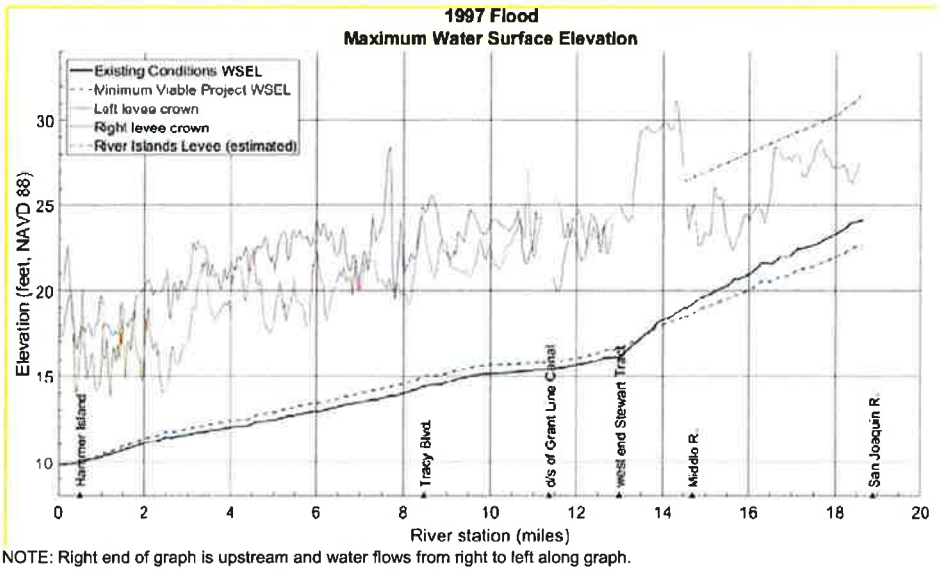
[1] The maximum increase in the design water surface elevation observed downstream of the proposed Paradise Cut expansion.



NOTE: Right end of graph is upstream and water flows from right to left along graph.

Figure 9
Comparison of Top-of-Levee Profiles and Water Surface Elevations within Paradise Cut under the 1997 Flood Scenario

Downstream of the Project, minor increases in flood stage west of Stewart Tract in Old River remain far below the top of levee and ample freeboard (generally 5 feet or more) remains (**Figure 10**). Freeboard is reduced to approximately 3 feet along the left levee crown a couple miles upstream of Hammer Island.

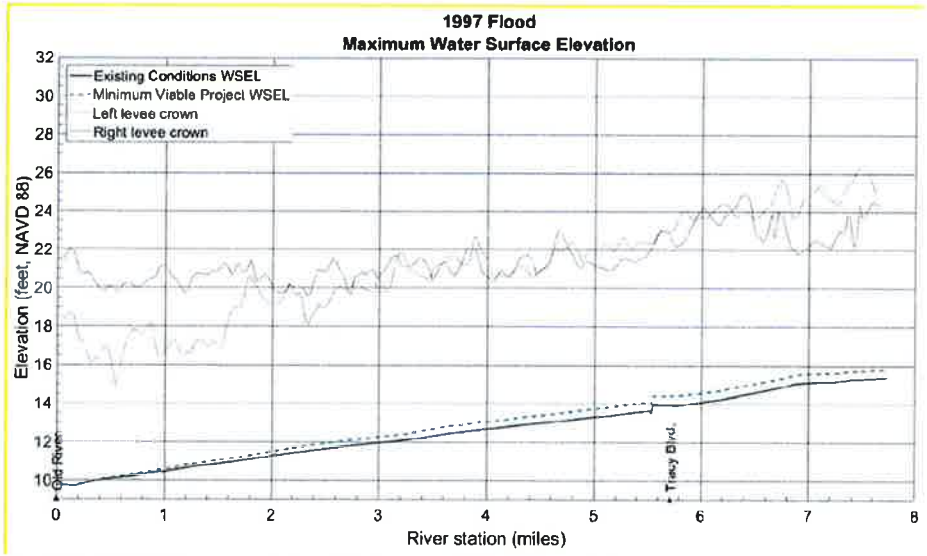


NOTE: Right end of graph is upstream and water flows from right to left along graph.

Figure 10
Comparison of Top of Levee Profiles and Water Surface Elevations within Old River under the 1997 Flood Scenario

Grant Line Canal has significant capacity relative to Old River and moderate increases in flood stage under the with-Project scenario remain several feet below either levee crest (**Figure 11**). The most constrained freeboard occurs approximately 0.5 miles upstream of the confluence with Old River, where freeboard is 5 feet above the

water surface elevation of the 1997 flood scenario; however, at this location, there is practically no difference between existing conditions and with-Project conditions (a 0.05-foot stage increase).



NOTE: Right end of graph is upstream and water flows from right to left along graph.

Figure 11
Top of Levee Profiles and Water Surface Elevations within Grant Line Canal under the 1997 Flood Scenario

Though overtopping is not anticipated to occur anywhere under the 1997 flood scenario, increases in flood stage and incremental loss of freeboard should be further evaluated using risk and uncertainty methods (e.g., HEC-FDA) to assess any increase in annual overtopping probability over the total range of larger potential flood events.

Evaluation of Potential for Erosion of the Channel Boundary

Channel boundaries are typically composed of a variety of materials (e.g., sediments, bedrock, vegetation, debris, and hydraulic structures) that can withstand a range of hydraulic forces before the material is compromised. Much work has been done to define the "permissible" velocities of channel materials. Fischenich (2001) includes a highly regarded compilation of this work.

Soils that comprise the boundary of the San Joaquin River and distributaries are readily mobilized by significant floods such as the 1997 event. Bank vegetation and various revetments (e.g., rock slope protection) that cover and integrate with the soil can prevent erosion of the banks and levees. **Attachment A** shows the maximum velocity that various materials can withstand before becoming unstable and eroding.

American Rivers (2019) documents velocity values from a one-dimensional HEC-RAS model that can present velocity only in terms of cross-sectional averages. In reality, peak velocities typically occur above the deepest portion of a river where most of the river current is funneled, or along the outside of a tight meander bend. Regardless, the average velocities reported by the available modeling under with-Project conditions are within ranges that can be managed with numerous vegetative or biotechnical measures or placement of riprap. Measures will vary based on the setting and risks to be managed, factors that cannot be fully specified until engineering design is complete. A two-dimensional hydraulic model of the Project area would allow for more precise (and potentially higher) velocity estimates.

Evaluation of Potential for Sedimentation within the Channel

Sedimentation occurs when the amount of sediment transported from upstream exceeds the transport capacity of the channel it enters. In this context, sediment mobilized through upstream erosion can result in downstream sedimentation. In addition, changes in flow regimes or channel geometry under with-Project conditions (e.g., widening) can reduce velocities and cause sediment or other mobilized materials to deposit. Though erosion and sedimentation are natural processes for rivers, excess sedimentation can result in a loss of channel capacity, localized erosion of adjacent riverbanks, and increased flood stages.

Sedimentation patterns are more difficult to assess and typically require a sediment transport model that can evaluate changes in sediment transport capacity over space and time. A sediment transport model has not been developed for the Project area at this time. Local landowners and the South Delta Water Agency have observed sedimentation in South Delta channels, which has reduced channel capacity in several locations. There are multiple important questions related to this sedimentation that will require further investigation in future phases of Project planning:

- The extent of sedimentation in key locations and channels
- The extent to which this sedimentation is a product of flow dynamics in Paradise Cut (as opposed to the larger hydrodynamics of the South Delta as a whole)
- The extent to which the Project may be expected to change sedimentation patterns in the selected locations

Recommendations

As the next phase of feasibility planning begins, refined hydraulic modeling is recommended to estimate velocities and shear stresses acting more precisely on the channel boundary and levees. A two-dimensional hydraulic model would allow for depth-averaged velocity and shear stress values for the entire study area and help to isolate areas of concern regarding erosion and sedimentation. Some level of sediment transport modeling may be required to analyze sedimentation patterns in areas of concern. In turn, refined modeling could be used to evaluate and select potential erosion strategies or changes in channel and/or floodplain geometry that may alleviate in-channel sedimentation concerns.

Existing levee performance data indicate that several levee segments are sensitive to increases in water surface elevations and that hazard-specific strategies may be required to address the potential increase in flood risk. The consequences of levee failure (as opposed to its likelihood) have not been evaluated at this time, but those will undoubtedly drive the inclusion of design strategies that target specific modes of levee failure. It appears from this initial analysis that strategies may be required to address seepage concerns near Stewart Tract, potentially including cutoff walls, seepage berms or other strategies.

Downstream of Stewart Tract, water surface elevations appear to be influenced by hydraulic controls imposed by the bridge crossing along Tracy Boulevard. Additional study is required to assess hydraulic impact strategies at these crossings. Given the small increase in flood risk along Old River and Grant Line Canal levees, monitoring and maintenance strategies may be more appropriate means of countering hydraulic impacts in the near term.

Finally, recent climate scenarios from the 2022 Update of CVFPP should be incorporated into the feasibility study to (1) account for potential changes to inland hydrology and sea levels and (2) design for the long-term resilience of the Project. It is possible under future climate scenarios that overtopping may become a more concerning mode of levee failure (especially at the eastern end of Paradise Cut) and that existing seepage concerns are exacerbated. The increased flood risk under future climate scenarios may favor nature-based solutions like setback levees that may deliver multiple benefits in a more financially efficient manner in the long

run. A comprehensive benefit-cost analysis is required to acknowledge and account for multiple social, environmental, and economic benefits

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ATTACHMENT A

PERMISSIBLE SHEAR AND VELOCITY FOR SELECTED LINING MATERIALS

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citations(s)
Soils				
	Fine colloidal sand	0.02–0.03	1.5	A
	Sandy loam (noncolloidal)	0.03–0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045–0.05	2	A
	Silty loam (noncolloidal)	0.045–0.05	1.75–2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3–4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
Gravel/Cobble				
	1-in.	0.33	2.5–5	A
	2-in.	0.67	3–6	A
	6-in.	2.0	4–7.5	A
	12-in.	4.0	5.5–12	A
Vegetation				
	Class A turf	3.7	6–8	E, N
	Class B turf	2.1	4–7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2–1.7	4–6	G, H, L, N
	Short native and bunch grasses	0.7–0.95	3–4	G, H, L, N
	Reed plantings	0.1–0.6	N/A	E, N
	Hardwood tree plantings	0.41–2.5	N/A	E, N
Temporary Degradable RECPs[2]				
	Jute net	0.45	1–2.5	E, H, M
	Straw with net	1.5–1.65	1–3	E, H, M
	Coconut fiber with net	2.25	3–4	E, M
	Fiberglass roving	2.00	2.5–7	E, H, M
Non-Degradable RECPs				
	Unvegetated	3.00	5–7	E, G, M
	Partially established	4.0–6.0	7.5–15	E, G, M
	Fully vegetated	8.00	8–21	F, L, M
Riprap				
	6-in. d_{50}	2.5	5–10	H
	9-in. d_{50}	3.8	7–11	H
	12-in. d_{50}	5.1	10–13	H
	18-in. d_{50}	7.6	12–16	H
	24-in. d_{50}	10.1	14–18	E
Soil Bioengineering				
	Wattles	0.2–1.0	3	C, I, J, N
	Reed fascine	0.6–1.25	5	E

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citations(s)
	Coir roll	3–5	8	E, M, N
	Vegetated coir mat	4–8	9.5	E, M, N
	Live brush mattress (initial)	0.4–4.1	4	B, E, I
	Live brush mattress (grown)	3.9–8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4–6.25	12	E, I, N
	Live fascine	1.25–3.10	6–8	C,E, I, J
	Live willow stakes	2.10–3.10	3–10	E, N, O
	Gabions	10	14–19	D
Hard Surfacing				
	Concrete	12.5	>18	H

1 Ranges of values generally reflect multiple sources of data or different testing conditions.

2 RECP = rolled erosion control products

A Chang, H.H.
B Florineth. (1982)
C Gertgraser, C. (1998)
D Goff, K. (1999)
E Gray, D.H., and Sotir, R.B. (1996)
F Julien, P.Y. (1995)
G Kouwen, N., Li, R.M., and Simons, D.B. (1980)
H Norman, J.N. (1975)
I Schiechtl, H.M. and R. Stern (1996)
J Schoklitsch, A. (1937)
K Sprague, C.J. (1999)
L Temple, D.M. (1980)
M TXDOT (1999)
N Data from Author (2001)
O USACE (1997)

SOURCE: Fischenich 2001

Exhibit F

Draft

PARADISE CUT EXPANSION AND SOUTH DELTA RESTORATION PROJECT

Existing and Needed Technical Studies

Prepared for
San Joaquin County Resource Conservation District

March 2023

Draft

PARADISE CUT EXPANSION AND SOUTH DELTA RESTORATION PROJECT

Existing and Needed Technical Studies

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San Joaquin County Resource Conservation District

March 2023

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PARADISE CUT EXPANSION AND SOUTH DELTA RESTORATION PROJECT

Existing and Needed Technical Studies

1 Introduction

This report provides a comprehensive summary of existing technical studies pertinent to the Paradise Cut Expansion and South Delta Restoration Project's (Project)[1] Preferred Conceptual Design, as described below and in American Rivers' Conceptual Design Technical Memorandum, dated April 9, 2019. It also identifies additional technical studies that may need to be undertaken by the lead agency or others before the Project as currently defined can be permitted or constructed. The San Joaquin Area Flood Control Agency (SJAFCA) was selected to lead the next phase of the Project in collaboration with the California Department of Water Resources, the San Joaquin County Resource Conservation District, the South Delta Water Agency, American Rivers, and a consortium of local reclamation districts.

Technical studies are defined to include those pertaining to the following issues, both within and downstream of Paradise Cut:

- Current and proposed hydrology and hydraulics
- Current and proposed sediment transport and deposition
- Current and proposed riparian, aquatic, and terrestrial ecosystem conditions
- Current and proposed channel capacities
- Current and proposed levee conditions
- Current and anticipated water quality conditions

Broadly speaking, these issues can be classified into two groups – a "hydrology and engineering" group encompassing the hydrology, hydraulics, geomorphology, and geotechnical topics and an

[1] The Paradise Cut Expansion and South Delta Restoration Project was formerly known (including in the American Rivers technical memorandum) as the Paradise Cut Conservation and Flood Management Project. The change in names reflects an increased emphasis on the inclusion of channel restoration dredging in the South Delta as part of the project. The quantity of channel restoration dredging ultimately to be included in the project is, along with many other elements of the project, subject to revision in future phases of project analysis, planning and design. The present document focuses on the project concept as described in the American Rivers technical memorandum, which includes channel restoration dredging, as summarized in Section 3.2.

"ecosystem and water quality" group encompassing those topics. These issues are discussed within these two groupings for the remainder of this report.

The existing studies include those that examined potential expansion of Paradise Cut directly as well as others that examined adjacent or nearby geographies (such as the River Islands development just northeast of Paradise Cut on Stewart Tract) or the lower San Joaquin region[2] as a whole. The needed technical studies include those that must be performed for the Project as currently defined to receive necessary permits and approvals, as well as other studies that may be necessary to further refine the project concept and address local stakeholder concerns, significant knowledge gaps, or areas of uncertainty pertinent to the project.

This report is based upon, and a successor to, a previous report outlining an environmental compliance and permitting strategy for the Preferred Conceptual Design.[3] That study preliminarily identified the following permits and approvals that the Preferred Conceptual Design would need to attain to proceed to construction:

- Central Valley Flood Protection Board Encroachment Permit
- Section 408 Permit under federal River and Harbors Act
- California Environmental Quality Act (CEQA) compliance
- National Environmental Policy Act (NEPA) compliance
- Federal Endangered Species Act Incidental Take Permits
- Clean Water Act Section 404 Permits
- Clean Water Act Section 401 Water Quality Certifications
- California Endangered Species Act Incidental Take Permit
- California Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement
- Delta Plan consistency determination

The present report identifies needed technical analyses in the context of these permitting and compliance requirements so that SJAFCA and others can prioritize any information gaps pertinent to these applications and compliance documents accordingly.

2 Anticipated Use of This Document

This document is intended to summarize relevant information on the existing technical studies that have been performed on Paradise Cut, as well as to identify needed studies that have not yet been performed. It is anticipated that SJAFCA will share this document with stakeholders in the Project area to help establish a shared understanding of what has been and what should be studied

2 The "lower" San Joaquin region refers to the lower-elevation, downstream end of the San Joaquin Valley, not its relative position on a map. Because the San Joaquin River flows northward, the "lower" San Joaquin Valley is north of the "upper" Valley.

3 San Joaquin County Resource Conservation District and American Rivers. 2019. *Paradise Cut Conservation and Flood Management Plan Project Environmental Compliance and Permitting Strategy.* Sacramento-San Joaquin Delta Conservancy Grant Agreement #Prop1-2015-Y1-012, Task 5. Prepared by Environmental Science Associates.

in preparation for the Project. Stakeholders may identify additional issues that require study, in which case this document may be revised to reflect their feedback.

In December 2021, the SJAFCA Board of Directors passed two motions affirming that SJAFCA will serve as the Project Lead for the Project, and that SJAFCA will enter into a funding agreement with the California Department of Water Resources (DWR) to perform a feasibility study and other work to identify a preferred project alternative and advance project planning. The feasibility study will assess the likely performance of potential project alternatives under both existing and anticipated future conditions, including the new estimations of potential future flood flows on the lower San Joaquin River produced by DWR in the 2022 Update to the Central Valley Flood Protection Plan (2022 CVFPP Update). Specification of a preferred alternative will enable additional fundraising from state and federal sources, development of engineering and restoration designs, and, once those designs have reached a sufficient level of refinement, commencement of the California Environmental Quality Act (CEQA) process and other permitting processes. This report is also intended to inform these efforts and other work that may be necessary to develop a complete engineering and restoration design for the Project.

3 Project Overview and Background

The goals of the Project are to (1) protect lives and property from catastrophic flooding, (2) restore areas of floodplain and riparian habitat as part of an expanded flood bypass, and (3) restore channel depths in the South Delta for multiple benefits.

3.1 Context of San Joaquin River flood management challenges

Paradise Cut is located near the lower end of the San Joaquin River, branching off from the mainstem of the river at approximately River Mile 60, several miles upstream from the cities of Manteca, Lathrop, and Stockton. Under current conditions, water periodically spills over a rock weir into Paradise Cut from the San Joaquin River during high flows. Water flows generally northwest through Paradise Cut for approximately six miles and empties into Old River. Paradise Cut is a component of the federal Lower San Joaquin River and Tributaries Project and California's State Plan of Flood Control (SPFC). The design channel capacity of Paradise Cut in the state and federal flood control projects is 15,000 cubic feet per second (cfs); however, due to sedimentation and other factors, the channel does not currently meet its design capacity (DWR 2017a).

By virtue of its location, Paradise Cut has potential to play a significant role in reducing serious flood risks in the lower San Joaquin Valley (Valley). DWR has estimated that under current conditions, the Expected Annual Damages (EAD) from flooding in the San Joaquin Basin are approximately $333 million per year, with an Expected Annual Life Loss (EALL) of 36 people, and that these risks are heavily concentrated in the lower (and more urbanized) end of the Valley (DWR 2022). Under the highest projected climate change scenarios modeled by DWR, EAD rises to as high as $1.96 billion per year and EALL to as high as 277 deaths per year in the San Joaquin Basin by 2072 if no additional action is taken to reduce these risks in the interim (DWR 2022).

Lowering flood water levels along the levees protecting the urbanized areas of the lower San Joaquin Valley, as the Project would do, would therefore make a significant contribution to flood risk reduction for the Valley as a whole.

For these reasons, expansion of Paradise Cut has consistently been identified as a key system-wide flood management priority in the Central Valley Flood Protection Plan (CVFPP) since its first edition in 2012 and continuing in the recent 2022 CVFPP Update. It is also recognized as a major multi-benefit project opportunity, given the ecosystem restoration potential at the site. The CVFPP Conservation Strategy (CS) sets out Conservation Strategy Measurable Objectives (CSMOs) for the restoration of identified ecosystem processes, habitats, and stressors in each of six sub-regions of the Central Valley. The CSMOs for the Lower San Joaquin region are shown in **Table 1** below. Achievement of these regional objectives is unlikely without a significant multi-benefit project at Paradise Cut.

TABLE 1
CONSERVATION STRATEGY MEASURABLE OBJECTIVES (CSMOS) FOR THE LOWER SAN JOAQUIN REGION*

Measurable Objective	Quantity
Inundated Floodplain – Major River Reaches (ac)	11,600
Inundated Floodplain – Bypasses and Transient Storage Areas (ac)	200
Riverine Geomorphic Processes – Natural Bank (mi)	13
Riverine Geomorphic Processes – River Meander Potential (ac)	200
Shaded Riparian Aquatic Cover – Natural Bank (mi)	13
Shaded Riparian Aquatic Cover – Riparian-Lined Bank (mi)	6
Riparian Habitat (ac)	5,800
Marsh and Other Wetland Habitat (ac)	100
Fish Passage Barriers: Channel-Wide Structures	0
Invasive Plants: Prioritized Species (infested acres)	34

NOTE:
* From Merced River confluence downriver

Governor Gavin Newsom's Water Resilience Portfolio, issued in 2020, included Action 25.4, which directed DWR to "update and refine the regional flood management strategy in the Central Valley Flood Protection Plan to account for the projected impacts of climate change in order to protect vulnerable communities and infrastructure and restore floodplains along the San Joaquin River and its tributaries." Expansion of Paradise Cut has been identified as one of the key components of this Valley-wide flood management strategy in subsequent working groups convened by DWR to execute Action 25.4.

3.2 Preferred Conceptual Design description

The Preferred Conceptual Design for Paradise Cut was developed in 2019 and is described in a technical memorandum authored by American Rivers (see Section 4.1.1.1). Though this version of the Project is accepted as the current Preferred Conceptual Design and is treated as such in this

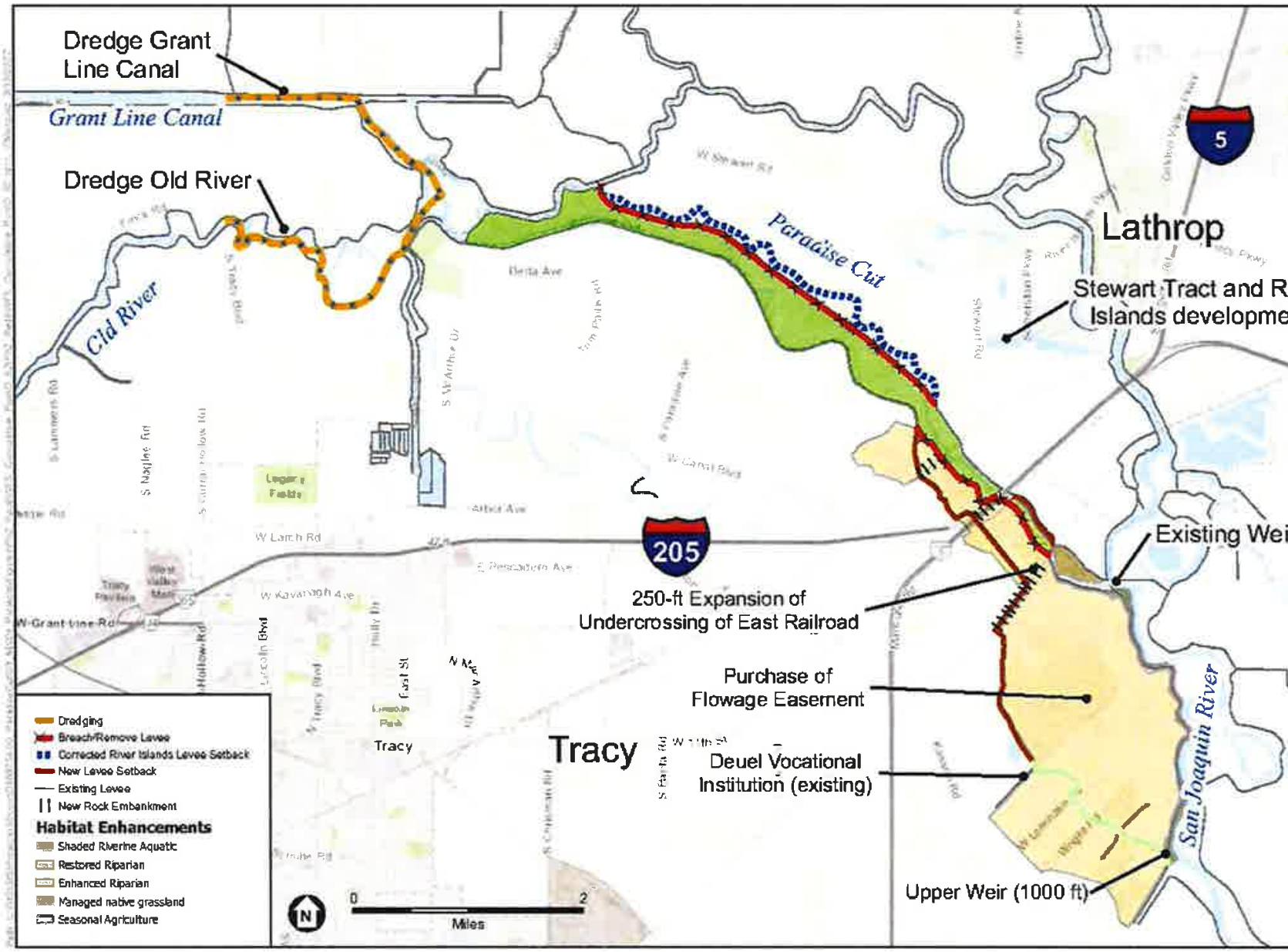
document, it will be subject to further evaluation and potential alteration in the feasibility study described briefly in Section 2. There are no engineering drawings, restoration plans, formal project descriptions or project specifications (beyond those summarized below) at the time of this writing.

The current Preferred Conceptual Design is positioned at the same location as the existing Paradise Cut, although an additional new weir located upstream, setback levees and other features would substantially expand it (see **Figure 1**). The current Preferred Conceptual Design includes:

- Installation of a new 1,000-foot weir on the left bank of the San Joaquin River approximately 3.1 river miles upstream of the existing rock weir
- Construction of about 7.8 miles of new setback levee, beginning about 1.3 miles away from the new weir at the southwest corner of the Deuel Vocational Facility, and including a 3.6-mile stretch of new setback levee on the right bank that was permitted, and constructed by the ongoing River Islands Development project.
- Removal of approximately 5.1 miles of existing levee, on the left bank of Paradise Cut between the eastern railroad to a point just downstream of the western railroad, and on the right bank from approximately the latter point to the western tip of Stewart Tract.
- Modifications to rock embankments where two railroad lines, the eastern Union Pacific Railroad (a.k.a. the "eastern railroad"), and the western Southern Pacific Railroad (a.k.a. the "western railroad") and Interstate 5 cross Paradise Cut
- A 250 ft. expansion of the eastern railroad undercrossing
- Channel depth restoration, including dredging of about 2 feet in depth, along approximately 5 miles of Old River and Grant Line Canal
- Installation of a new check valve structure on an existing conveyance structure that brings water into Tom Paine Slough, to limit floodwaters from entering Tom Paine Slough at times of high flow
- Conversion of about 0.5 miles of breached existing levee to high-ground refuge habitat for small mammals and reptiles
- Purchase of new flood and conservation easements on agricultural land between the new weir and a point just downstream of the western railroad
- Retention of existing seasonal agriculture suitable for Swainson's hawk foraging habitat between the new weir and a point just downstream of the western railroad
- Restoration of riparian habitat within the existing Paradise Cut footprint from the eastern railroad track to the vicinity of the Old River confluence, a distance of about 6.1 miles of varying width
- Restoration of native grassland habitat within the channel between the existing rock weir and the eastern railroad, a distance of approximately 0.65 miles
- Restoration of shaded riverine aquatic habitat along the left bank of the mainstem San Joaquin River between the existing and proposed weirs, a distance of approximately 2.7 miles

3.3 Preferred Conceptual Design anticipated benefits

According to technical analysis performed in American Rivers (2019), the Preferred Conceptual Design would result in a flood stage reduction in the San Joaquin River between Mossdale and Stockton of up to two feet for the authorized design flood condition. It would expand the area subject to flooding in Paradise Cut from approximately 875 acres to 2,970 acres, a net increase of 2,095 acres. Most of that new area would remain in agriculture but be subject to occasional flooding (estimated as less than a 10 percent chance in any given year). Initial modeling of the Preferred Conceptual Design indicated that channel capacity restoration activities would reduce flood stage along Old River and Grant Line Canal by about 1.5–2.0 inches (0.13–0.17 feet).


Dredge Grant Line Canal
Grant Line Canal
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Old River
Paradise Cut
Lathrop
Stewart Tract and R
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Existing Wei
205
250-ft Expansion of
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Purchase of
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Institution (existing)
Upper Weir (1000 ft)
San Joaquin River
Tracy
Tracy
Dredging
Breach/Remove Levee
Corrected River Islands Levee Setback
New Levee Setback
Existing Levee
New Rock Embankment
Habitat Enhancements
Shaded Riverine Aquatic
Restored Riparian
Enhanced Riparian
Managed native grassland
Seasonal Agriculture
N
0
2
Miles

4 Existing Technical Studies

State and local agencies have contemplated potential expansion of Paradise Cut, in various forms, for over 20 years. It has been identified as a system-wide flood management priority since the initial edition of the CVFPP in 2012. While mentions of Paradise Cut expansion exist in technical documents from as long ago as 1999, many early descriptions of potential project concepts are too general to be of specific applicability today and have been refined over time through substantial additional analysis and dialogue among stakeholders. Furthermore, to the extent that any modeling was performed on early iterations of Paradise Cut expansion proposals, it made use of hydraulic models that have now been superseded. This summary therefore focuses on the most recent technical studies of the greatest relevance to future progress on project definition and development.

4.1 Engineering and hydraulic studies

Previous hydraulic studies pertinent to the Project fall into three broad categories:

- Studies of alternative preliminary project proposals for Paradise Cut
- Studies of the impacts of the River Islands project on Stewart Tract
- Data and research pertinent to channel capacity restoration in the South Delta

These are summarized in **Table 2** and described in greater detail below.

American Rivers	2019	Conceptual Design Technical Memo: Paradise Cut Expansion Project	Paradise Cut from proposed Upper Weir to Fabian Tract	Minimum Viable Project (current project definition); Potential Maximum Project	Yes	Yes	Control Project design flood; 1997 flood; 100-yr flood with climate change (235,000 cfs)	Peak flood discharge (d freeboard, a velocity at k measureme points
MBK	2018	Hydraulic Impact Analysis for River Islands at Lathrop, Update for New Existing Condition and Revised No Action Scenario	Vernalis to Fabian Tract, Stockton ship channel and Tracy Blvd crossing of Middle River	Scenarios of MBK (2012) with revisions to scenarios #2 and #3, including completion of River Islands Phase 2A and 2B interior levees	No	Yes	Existing 50-, 100- 200- and 500-year floods	Peak water surface elev
DWR	2017b	Basin Wide Feasibility Study for San Joaquin Basin	Paradise Cut from proposed Upper Weir to Stark Tract	13 options modeled; Option M-Ag similar to American Rivers (2019) Minimum Viable Project	No	Yes	Existing hydrology 200-year flood	Peak water surface elev (ft); Ecosyst recreation, l conversion metrics
MBK	2015	Delta Dialogues Paradise Cut Expansion Scenario	Vernalis to Fabian tract	Primary scenario included new 1,000-ft weir and 500-ft opening in Union Pacific Railroad east embankment plus PC levee setbacks	No	Yes	1986 100% (~50,000 cfs), 1956 120% (~85,000 cfs) and 1997 115% (~112,000 cfs) simulations, w/ and w/o SLR	Peak water surface elev with and wit project
PBI	2014	200-Year Freeboard Analysis & Floodplain Mapping within RD 17	Vernalis to Fabian Tract, Stockton ship channel and Tracy Blvd crossing of Middle River	Existing conditions (as of 2014)	No	Yes	Existing hydrology 200-year flood	Peak water surface elev 200-year floodplain u levee breac scenarios fo right-bank S only

MBK	2014	River Islands at Lathrop Hydraulic Impact Analysis		[Editorial revisions only to MBK 2012 below]				
MBK	2012	River Islands at Lathrop Hydraulic Impact Analysis	Vernalis to Fabian Tract, Stockton ship channel and Tracy Blvd crossing of Middle River	(1) Pre-River Islands conditions; (2) 2010 existing conditions after River Islands Phase I levee built; (3) setback of right bank PC non-federal levee; (4) River Islands full project w/ Old River levee setback	No	Yes	Existing 50-, 100-, 200- and 500-year floods	Peak water surface ele Maximum inundation a Change in exceedance probability
MBK	2010	River Islands at Lathrop Hydraulic Analysis in Support of Risk Based Hydraulic Impact Analysis	Vernalis to Fabian Tract, Stockton ship channel and Tracy Blvd crossing of Middle River	(1) Pre-River Islands conditions; (2) 2010 existing conditions after River Islands Phase I levee built; (3) setback of right bank PC non-federal levee; (4) River Islands full project w/ Old River levee setback	No	Yes	Existing 2-, 10-, 25-, 50-, 100-, 200- and 500-year floods	Peak water surface ele and peak discharge (
MBK	2006	River Islands at Lathrop Analysis of Hydraulic Impacts on Federal Flood Project Design Capacity	Vernalis to Fabian Tract, Stockton ship channel and Tracy Blvd crossing of Middle River	(1) Pre-River Islands; (2) River Islands project completion; (3) River Islands plus Paradise Cut Improvement Project with setback levee on right bank of PC downstream of Union Pacific Railroad	No	Yes	San Joaquin River Flood Control Project design flood	Peak water surface ele and peak discharge (
MBK	2002	River Islands at Lathrop Hydraulic Impact Analysis	Vernalis to Fabian Tract, Stockton ship channel and Tracy Blvd crossing of Middle River	(10 Pre-River Islands conditions; (2) River Islands completion plus Paradise Cut Improvement Project with setback levee between Union Pacific Railroad and I-5	No	Yes	Existing 10-, 50-, 100-, and 200-year floods	Peak water surface ele

SOURCE: ESA 2022

4.1.1 Recent studies of Paradise Cut alternatives

4.1.1.1 American Rivers (2019)

This study identified and examined the Preferred Conceptual Design as a refined variant of project alternatives previously developed in DWR (2017b). It examined four alternatives, as shown in **Table 3**.

TABLE 3
DESCRIPTION OF PARADISE CUT PROJECT ALTERNATIVES IN AMERICAN RIVERS (2019)

Alternative Name	Alternative Description
CVFPP	Option M-Ag from the 2017 Central Valley Flood Protection Plan, as analyzed in the 2017 Draft San Joaquin River Basin-Wide Feasibility Study
Modified CVFPP	CVFPP plus 5 miles of channel capacity restoration in Old River and Grant Line Canal and with adjustments in setback levee configuration
Minimum Viable Project (MVP)	Modified CVFPP without levee setback along the western edge of the bypass expansion area south of Deuel Vocational Institute (DVI) and with 250-foot opening at eastern Union Pacific Railroad crossing instead of 500-foot opening
Potential Maximum Project (PMP)	MVP with 500-foot openings at all rail and highway crossings and major new setback levee along the northern end of Paradise Cut

The Minimum Viable Project (which subsequently became the Preferred Conceptual Design) was developed as a less expensive alternative that eliminated 1.5 miles of setback levee from the two CVFPP alternatives and reduced the size of the undercrossing of the eastern railroad. The Potential Maximum Project, by contrast, included 500-foot openings beneath both railroads and I-5, as well as 2.5 additional miles of levee setback on the northern end of the project area. Figures from American Rivers (2019) illustrating the alternatives are shown in Attachment A.

These alternatives were evaluated under three hydrologic scenarios:

- The design flood for the federal San Joaquin River Flood Control Project (52,000 cfs at Vernalis)
- The 1997 flood (110,000 cfs at Vernalis)
- The 100-year (1 percent annual exceedance probability) flood plus anticipated effects of climate change (235,000 cfs at Vernalis)

In the 1997 flood scenario, levee breaches and relief cuts were assumed to be the same as those that actually occurred in 1997, except in cases where levees have been significantly improved since then or are part of the Project. In the other two scenarios, no levee breaches or relief cuts are assumed and flooding is therefore modeled to occur only where levees overtop.

Hydraulic modeling was performed for all alternatives under all scenarios listed above, with particular focus on the following hydraulic performance criteria:

- Peak flood stage reduction on the San Joaquin River downstream of the existing weir adjacent to Mossdale Tract

- Peak flood stage change on Grant Line Canal and Old River downstream of Paradise Cut
- Peak flood velocity on Grant Line Canal and Old River downstream of Paradise Cut
- Change to freeboard in above locations

Modeled changes in peak flows are summarized in Figures 7 and 8 in American Rivers (2019), included as Attachment B. Modeled changes in water surface elevations and freeboard from American Rivers (2019) are included as Attachment C. Overall, the modeling showed incremental decreases in freeboard, generally in the range of five to seven percent loss of available freeboard, under the 1997 flood scenario.

The modeling also showed velocity spikes at multiple locations within the Project footprint and recommends further analysis to avoid or mitigate such spikes.

4.1.1.2 DWR (2017a) and (2017b)

Both the 2017 Central Valley Flood Protection Plan (DWR 2017a) and the 2017 Basin-Wide Feasibility Study for the San Joaquin Basin (DWR 2017b) included a version of a Paradise Cut project referred to as "Option M-Ag" that is similar to the Preferred Conceptual Design, except for the following major differences:

- They did not include channel capacity restoration activities in downstream channels.
- They included an additional 1.5-mile setback levee south of Deuel Vocational Institution.
- They included a 500-foot (as opposed to 250-foot) opening under the eastern railroad.

Option M-Ag was one of fourteen Paradise Cut project alternatives assessed in DWR (2017b), including two variants of Option M: one that left most land within the levee setback area in agriculture (Option M-Ag) and another that assumed more extensive restoration of agricultural lands to riparian and grassland (Option M-Riparian). Compared to Option M, the other alternatives all had either significantly shorter lengths of left-bank setback levee (e.g., 1,000 feet or less, compared to more than 4,000 feet for Option M) and expanded the existing weir rather than constructing a new weir. Each of the fourteen project alternatives was evaluated for a 200-year flood event under existing hydrology. For this scenario, the following performance criteria were evaluated:

- Paradise Cut Weir peak flow
- Changes in distribution of flow relative to baseline downstream of Paradise Cut Weir
- Peak stage reduction relative to baseline on the San Joaquin River at Mossdale
- Peak stage increase relative to baseline at Paradise Cut – Old River confluence
- Peak stage reduction relative to baseline on the San Joaquin River at Howard Rd. Bridge
- Potential increase in habitat acreage
- Estimated cost

Compared to other alternatives, Option M produced significantly more stage reduction for the San Joaquin River at Mossdale (2.0 feet compared to <1 foot) and at the Howard Rd. Bridge

(1.7 feet compared to <0.63 feet) with roughly comparable peak stage increases at the Paradise Cut–Old River confluence (0.5 feet, compared to a range from 0.3 to 0.9 feet for other alternatives). Option M-Ag was estimated to cost $217 million and Option M-Riparian to cost $231 million, not including the cost of additional downstream levee improvements, estimated at $91 million in both Option M alternatives.

4.1.1.3 *Delta Dialogues*

MBK (2015) summarizes a hydraulic modeling exercise performed for the Paradise Cut expansion scenario resulting from the "Delta Dialogues," a voluntary and non-binding series of dialogue workshops held with key Delta stakeholders in 2014. The Delta Dialogues scenario was a preliminary version of project alternatives later analyzed in DWR (2017a and b) and American Rivers (2019). It included the construction of a new 1,000-foot-wide weir approximately 2,000 feet downstream of the Banta Carbona Canal; creation of a transitory storage area east of the Union Pacific Railroad and the Deuel Vocational Institution; a new 2.8-mile-long setback levee on the south bank of Paradise Cut; and a 500-foot-wide opening in the Union Pacific Railroad east embankment. The hydraulic modeling for the largest flow examined (115 percent scaling of the 1997 flood, or approximately 112,000 cfs at Vernalis) showed peak water surface elevation decreases of 2.76 feet at Banta Carbona Canal, 1.68 feet at Old River, and 1.26 feet at Howard Road, adjacent to Mossdale Tract. Peak water surface elevations within and downstream of Paradise Cut were modeled to increase by 0.25 feet at Paradise Road, 0.41 feet at Tracy Boulevard on Old River, and 0.35 feet at Tracy Boulevard on Grant Line Canal.

4.1.2 Studies of River Islands impacts

A series of hydraulic impact analyses were performed for the River Islands development on Stewart Tract (MBK 2002, 2006, 2010, 2012, 2014, and 2018), and the 2012 analysis was also incorporated into the Draft Environmental Impact Statement for River Islands (USACE 2014). Paradise Cut forms the western boundary of Stewart Tract, and the River Islands project set back 3.6 miles of levee on the right bank of Paradise Cut in 2019.

The most recent of these hydraulic analyses (MBK 2012, 2014, and 2018) examined 50-, 100-, 200-, and 500-year floods under existing hydrology and assessed peak water surface elevations and (in 2012) the maximum inundation area and change in exceedance probability for a given flow event. These studies were limited to only the potential hydraulic impacts of the River Islands project and therefore did not include any characterization of a larger Paradise Cut expansion apart from the actions listed above. The hydraulic modeling environment developed for these studies was subsequently used to assess Paradise Cut alternatives directly in American Rivers (2019).

4.1.3 Studies and activity pertinent to channel depth restoration in South Delta

Restoration of channel depths in various South Delta watercourses has been the subject of various studies and activities in recent years, summarized below.

4.1.3.1 Planning Guide for the Channel Depth Restoration Program for the South Delta Channels

Anchor (2021) presents a strategy for implementing a channel depth restoration program in the South Delta, including (but not limited to) the following detailed planning-level information:

- An assessment of known site conditions and identification of missing site condition information
- A description of applicable channel depth restoration methods
- An order-of-magnitude assessment of dredging volumes and site capacity needs
- A framework for completing the environmental compliance and permitting process

Among the data and findings presented in this document are:

- Results of investigative testing of sediment in Old River and Middle River in 2021, which show a very wide range of sediment grain sizes and geotechnical conditions within the Program area.
- Results of chemistry analysis performed on the samples collected above, showing that the examined samples:
  - Do not contain contaminant[4] levels of concern for potential upland placement of dredge spoils
  - Do not show exceedances for standards pertinent to potential landfill disposal (but will likely require further testing for confirmation)
  - Do show some exceedances for standards pertinent to potential placement in or near water, but that these results do not necessarily preclude such placement (additional testing is likely to be required for confirmation)
- Potential reuse of sediment to build levees "may be limited" but dredged sediment "could be used to increase upland elevations of dry land and marshes to protect against sea level rise and flooding" (Anchor 2021, p. 9).
- Ongoing maintenance dredging is likely to be required, but its scale and frequency depend on the shoaling rate (i.e., sediment deposition rate) in the channels, which has not yet been sufficiently estimated. A sediment budget for the San Joaquin River is not available; were such information available, it would yield a much better understanding of shoaling and channel sediment-related processes (see Anchor 2021, Section 5.1.1.2).
- Target dredging elevations for South Delta channels, including Paradise Cut, Old River, and Fabian & Bell Canal, are generally identified as the deepest historical elevations as identified in the 1934 National Oceanographic and Atmospheric Administration (NOAA) soundings.
- Reconnaissance-level estimates of dredging quantities from South Delta channels, including Paradise Cut, Old River, and Fabian & Bell Canal.
- Reconnaissance-level estimates of dredging quantities from South Delta channels, including Paradise Cut, Old River, and Fabian & Bell Canal range from a lower bound of 1,520,000

[4] Tests were performed for trace metals, sulfide, pesticides, polychlorinated biphenyl (PCB) cogeners, polycyclic aromatic hydrocarbons (PAHs), and methyl mercury.

cubic yards to an upper bound of 6,507,000 cubic yards (including a 1-foot overdredge allowance in both cases).

- A new hydrographic survey should be performed since available bathymetric data are more than a year old; the cost of such a survey is estimated at $280,000–$350,000.
- To estimate sediment accretion rates and patterns, data from at least three hydrographic surveys conducted at least a year apart is needed. Variability in flood flows during these years is an implicit assumption in seeking at least 3 years of data; during droughts or periods without flood flows additional data collection may be merited.
- "No modeling or analysis has been conducted to evaluate how the restoration of these historical channel depths would influence net flows, water quality, fish migration, or conditions during floods" and such analysis must be performed as part of any channel restoration program design.
- "Prior to engineering design, an analysis of the sediment engineering characteristics should be performed to evaluate the sediment behavior for dredging and dewatering, slope stability, and post-construction uses…A more robust geotechnical evaluation may be required to assess potential impacts of dredging to the adjacent levees and banks, as well as the potential for levee soils to support equipment loads if landside access is required during mobilization or dredging operations."

4.1.3.2 Bathymetric data comparison

MBK Engineers reviewed the status of bathymetric data of Paradise Cut and the channels immediately downstream, including Old River below the Paradise Cut confluence and Grant Line Canal (see **Figure 2**), as part of the modeling effort undertaken for American Rivers (2019). While finely detailed bathymetry is generally not necessary for effective hydraulic modeling (since the effects of localized bathymetric variations are accounted for in a hydraulic model's calibration), the intent of the review was to assess the magnitude of any discrepancies between the bathymetric data used in the Central Valley Flood Evaluation and Delineation (CVFED) analysis (upon which the MBK hydraulic modeling effort was based) and newer bathymetric data from 2018 made available to MBK by the South Delta Water Agency on behalf of the local Reclamation Districts.

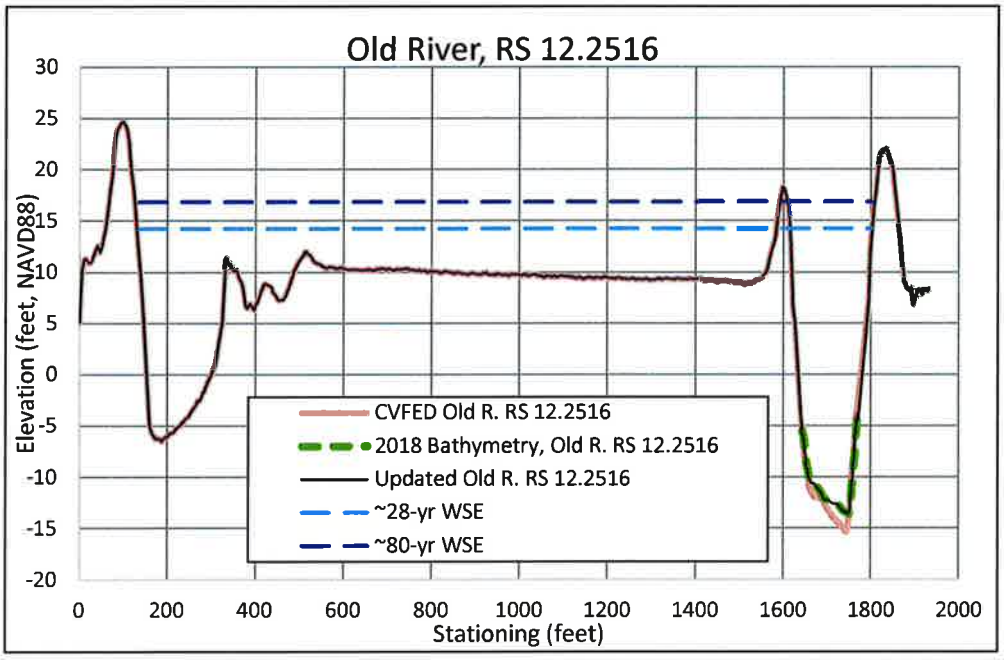
Channel cross-sections present in both datasets were directly compared, as in the examples shown in **Figure 3**. Discrepancies at locations-in-common varied in magnitude across the study area. The newer bathymetric data were incorporated into the hydraulic modeling for American Rivers (2019) to ensure that it reflected best-available information.

The 2018 bathymetric data may also be of use in scoping channel depth restoration activities, and any needed mitigation or long-term maintenance strategy for these channels, in a final Project. The South Delta Water Agency has also committed to providing annual bathymetry data to provide additional data for sediment tracking.

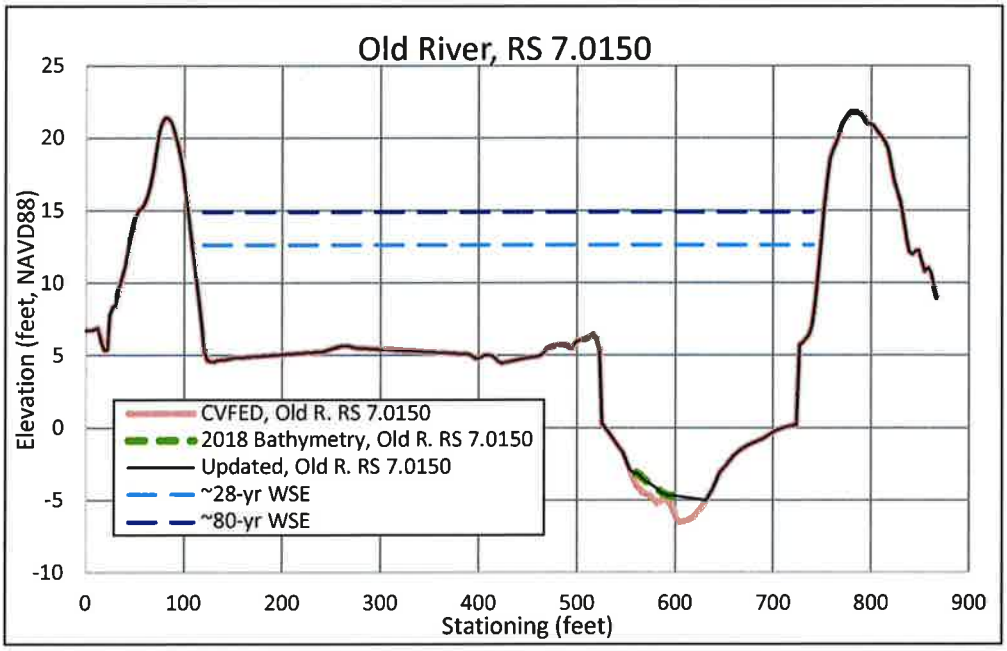
Figure 3 Example Bathymetric Cross-Section Comparisons

Prepared by MBK Engineers for American Rivers (2019)

(a) Paradise Cut (left channel) and Old River (right channel) in vicinity of



(b) Old River in vicinity of



4.1.3.3 South Delta barriers programs

DWR implemented the South Delta Temporary Barriers Project from 1987 to 2008, with the dual purposes of improving conditions for migrating salmon and improving conditions for agricultural diversions (DWR 2013). More recently, DWR's Temporary Barriers Program (TBP) has distinguished between the Agricultural Barriers Project Element, which is intended to protect senior water rights in the South Delta, and the Head of Old River Barriers (HORB) Project Element, which is intended to benefit anadromous fish migrating through the South Delta.

The TBP Agricultural Barriers Project Element consists of three barriers at the following locations:

- Middle River (near the confluence of Middle River with Victoria Canal)
- Grant Line Canal (about 100 yards upstream of Tracy Boulevard bridge)
- Old River (east of the Delta-Mendota Canal, approximately 4,000 feet southeast of the intersection of the Alameda, Contra Costa, and San Joaquin County lines)

The TBP Agricultural Barriers Project Element was developed to mitigate impacts of the State Water Project and Central Valley Project export facilities' operation on agricultural diverters in the South Delta. State Water Project and Central Valley Project operation lowers water levels, causes reverse flows, diminishes the influence of tides, and may affect water quality in the South Delta channels. To lessen these impacts and protect senior water rights, the TBP Agricultural Barriers Project Element is intended to accomplish the following benefits in the South Delta channels:

- Maintain water levels
- Improve circulation patterns
- Improve water quality

The TBP HORB Project Element consists of a seasonal fish barrier, installed twice per year in the Old River channel at the San Joaquin River. These two installations are referred to as the spring and fall fish barriers and have the following objectives:

- The spring HORB is intended to increase the survival of juvenile outmigrating salmon by blocking the Old River divergence from the San Joaquin River, thus preventing their use of this migratory pathway, which leads toward the State Water Project and Central Valley Project pumping plants.
- The fall HORB is intended to minimize the water quality effects of tidal flow reversals (low levels of dissolved oxygen) and increase attractive flows to benefit returning adult salmon in the San Joaquin River.

The fall HORB has been put in place most years since 1963. Installation of the spring HORB began in 1992, and the rock barrier has been installed 15 times since then (high flows on the San Joaquin, or court rulings, prevented installation in the other years). A nonphysical fish barrier was tested at the Head of Old River in 2009 and 2010 (see Section 4.2.4, below).

The South Delta Improvement Program was intended to replace the temporary rock barriers of the TBP with permanent operable gates. A final Environmental Impact Report/Statement was prepared for the program in 2006 but, as of this writing, has not yet been implemented (DWR 2013).

4.2 Ecosystem studies

Previous ecosystem studies pertinent to the Project generally fall into three categories:

- Regional assessments of ecological conditions in the South Delta
- Environmental compliance documents for the River Islands project
- Species-specific studies and plans

These are described in greater detail below and summarized in **Table 4**.

4.2.1 Regional assessments of ecological conditions

Three studies contain descriptions and assessments of the overall ecological and habitat conditions in the region. The Basin Wide Feasibility Study for the San Joaquin Basin (DWR 2017b), though not primarily an ecosystem study, identifies needed habitat in the lower San Joaquin Valley with a focus on the target species of conservation concern identified in the CVFPP CS. These species are identified in **Table 5**. The CS also identifies Measurable Objectives for each of six Conservation Planning Areas in the Central Valley, as shown in Table 1. The Project is within the Lower San Joaquin River Conservation Planning Area (defined as the entire San Joaquin River reach below the Merced confluence) and is expected to make a substantial contribution to the achievement of the region's Measurable Objectives. The CS also contains a summation of existing conservation objectives from other plans in both its 2016 edition (DWR 2016, Appendix J) and 2021 Update (DWR 2021, Appendix C).

City of Lathrop	2021	River Islands at Lathrop Phase 2 Project Draft Subsequent Environmental Impact Report	Paradise Cut, Stewart Tract and vicinity	~49 species including all CS target species present in the San Joaquin Valley	Yes	No	No
NMFS	2018	Recovery Plan for the Southern Distinct Population Segment of North American Green Sturgeon	Lower San Joaquin Valley	Green sturgeon	Yes	Yes	Yes
DWR	2017	Basin Wide Feasibility Study for San Joaquin Basin	Paradise Cut	Not species specific, but focus is on CS target species esp. salmon and steelhead	No	Yes	Yes
USFWS	2017	Recovery Plan for the Giant Garter Snake	Lower San Joaquin Valley and Delta	Giant garter snake	Yes	Yes	Yes
Matocq et al.	2017	Final Report: Population Genetic Structure of the Riparian Brush Rabbit (Sylvilagus Bachmani Riparius): Using Multiple Marker Systems to Gain Insight into Historic and Ongoing Genetic Connectivity	Lower San Joaquin Valley and South Delta	Riparian brush rabbit	Yes	Yes	Yes
DWR	2016	Central Valley Flood Protection Plan Conservation Strategy (esp. Appendix G, Focused Conservation Plans)	Lower San Joaquin Valley Conservation Planning Area (below Merced River confluence)	All CS target species (see Table 5)	Yes	Yes	No
Ascent	2016	USFWS and NMFS Biological Assessment for the River Islands at Lathrop Project	Paradise Cut, Stewart Tract and vicinity	Riparian brush rabbit, giant garter snake, Delta smelt, green sturgeon, Central Valley steelhead, Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon	Yes	Yes	Yes

NMFS	2014	Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead	Lower San Joaquin Valley	Central Valley Spring-Run Chinook salmon and Central Valley steelhead	Yes	Yes	Yes
USACE	2014	Draft Environmental Impact Statement for River Islands at Lathrop, Phase 2B	Paradise Cut, Stewart Tract and vicinity	55 species including all CS target species except riparian woodrat, bank swallow, California black rail, Least Bell's vireo, and western yellow-billed cuckoo	Yes	Yes	Yes
ESA PWA	2012	BDCP South Delta Habitat and Flood Corridor Planning Corridor Description and Assessment Document	South Delta to Vernalis	Not species specific; focused on habitats w/r/t tidal elevation zones	Yes	Yes	Yes
Sycamore	2004	Riparian Brush Rabbit Mitigation and Management Plan for River Islands at Lathrop	Paradise Cut, Stewart Tract and vicinity	Riparian brush rabbit	Yes	Yes	Yes
City of Lathrop	2003	Final Subsequent Environmental Impact Report for River islands at Lathrop	Paradise Cut, Stewart Tract and vicinity	38 species including all CS target species except bank swallow, CA black rail, least Bell's vireo, western yellow-billed cuckoo, riparian woodrat, and green sturgeon	Yes	No	No
San Joaquin County	2000	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan	San Joaquin County	97 species including all CS target species except Least Bell's vireo and Central Valley steelhead and salmon runs	Yes	Yes	Yes
USFWS	1998	Recovery Plan for Upland Species of the San Joaquin Valley	San Joaquin Valley	34 species including riparian brush rabbit and riparian woodrat	Yes	No	No

NOTES:

TABLE 5
CVFPP CONSERVATION STRATEGY TARGET SPECIES PRESENT IN LOWER SAN JOAQUIN VALLEY

Common name	Scientific name
California black rail	*Laterallus jamaicensis coturniculus*
California Central Valley steelhead DPS	*Oncorhynchus mykiss*
Chinook salmon – Central Valley fall- and late-fall-run, Central Valley spring-run ESUs	*Oncorhynchus tshawytscha*
Delta button-celery	*Eryngium racemosum*
Delta smelt	*Hypomesus transpacificus*
Giant garter snake	*Thamnophis gigas*
Greater sandhill crane	*Grus canadensis tabida*
Green sturgeon – southern DPS	*Acipenser medirostris*
Least Bell's vireo	*Vireo bellii pusillus*
Riparian brush rabbit	*Sylvilagus bachmani riparius*
Riparian woodrat	*Neotoma fuscipes riparia*
Slough thistle	*Cirsium crassicaule*
Swainson's hawk	*Buteo swainsoni*
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*

NOTES:
DPS = Distinct population segment
ESU = Evolutionarily significant unit

SOURCE: ESA 2022

The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (San Joaquin County 2000) includes 97 species, including all CS target species except for the Chinook salmon, Central Valley steelhead, and least Bell's vireo. It includes descriptions, mapping, and quantification of habitats as they existed at the time of authorship (now over 20 years ago), and also indicates actual incidences of these species to the USGS quad sheet level. The Plan is still in force in San Joaquin County and is the basis for a number of operating habitat preserves within the county that provide potential mitigation acreage for a variety of species and habitat types.

ESA PWA (2012) contains quantification, mapping, and written descriptions of existing habitat types in Corridor 2A (Paradise Cut from the weir to Grant Line Canal). It depicts a corridor in which agriculture is the predominant land use, with only very slender strips of riparian habitat (concentrated on the upper end of the reach) and a small area of wetlands at the downstream end. It also assesses the potential expansion of riparian habitat resulting from levee setbacks on both sides of Paradise Cut that would increase the floodway from 1,189 acres to 2,289 acres.

4.2.2 Environmental compliance documents for the River Islands project

City of Lathrop (2021, 2003), US Army Corps of Engineers (USACE 2014) and Ascent (2016) are major environmental compliance documents related to the River Islands project on Stewart Tract. Paradise Cut forms the southwestern boundary of Stewart Tract, and thus some of the land area encompassed within the Preferred Conceptual Design is included within these analyses. City of Lathrop (2003) was the primary Environmental Impact Report covering the River Islands project under CEQA and was amended six times (in 2005, 2007, 2021, 2014, 2015 and 2018) to provide CEQA coverage to ongoing refinements of the River Island project. City of Lathrop (2021) ultimately supplemented and superseded City of Lathrop (2003) and its amendments. USACE (2014) is an Environmental Impact Statement covering the River Islands project under the National Environmental Policy Act (NEPA) and covers a somewhat larger number of species (about 55) than the City of Lathrop documents, including most of the CS target species. USACE (2014) describes, quantifies, and maps habitat areas, reports incidences of these species within the study area, and identifies potential mitigation measures for impacts to species and habitats.

Ascent (2016) is a federal Biological Assessment that focuses primarily on fish species – two runs of Chinook salmon (Central Valley spring-run and Sacramento River winter-run), Central Valley steelhead, green sturgeon, and Delta smelt – along with the riparian brush rabbit and giant garter snake. It describes, quantifies, and maps habitats areas and reports incidences of these species within the study area. Given the proximity to, and partial overlap with, the footprint of the Project, these studies offer useful information for restoration planning as well as for the anticipation of potential impacts of project construction and potentially suitable mitigation measures.

4.2.3 Species-specific studies and plans

Target species of conservation importance in the lower San Joaquin Valley and South Delta are subject to several conservation and recovery plans, as well as status reviews and other single-species studies and assessments.

The CVFPP CS formulated Focused Conservation Plans for each of the CS target species listed in Table 5. These are presented in DWR (2016) Appendix G. Each Focused Conservation Plan is a comprehensive summation of the scientific literature pertinent to the species and its associated conservation needs. They include descriptions of each species' conservation status, physical distribution, and life history, as well as the threats, impacts, and conservation opportunities that exist for each species, including the potential impacts of specific floodplain management actions (e.g., "modification of floodplain topography" or "invasive plant management") on the species.

Recovery plans are prepared for federally listed endangered species and include, among other things, detailed description of needed habitat characteristics, as well as prioritized actions and quantified recovery goals for relevant geographies. The riparian brush rabbit and riparian woodrat were both included in the US Fish and Wildlife Service (USFWS 1998) recovery plan for terrestrial species in the San Joaquin Valley. National Marine Fisheries Service (NMFS 2014) is a recovery plan focusing on three salmonid species, one of which (Central Valley Steelhead) has

critical habitat in the river channels of the lower San Joaquin Valley, including Paradise Cut and Old River. NMFS (2018) is a recovery plan focused on the green sturgeon, whose critical habitat includes the lower San Joaquin River and South Delta. USFWS (2017) is a recovery plan for the giant garter snake, whose critical habitat includes Paradise Cut and the remainder of the lower San Joaquin Valley. The riparian brush rabbit is endemic to the San Joaquin Valley and no longer exists in the wild anywhere else, so all studies of the species (e.g., Matocq et al. 2017; Sycamore 2004) include the lower San Joaquin Valley within their study context.

4.2.4 Studies of salmonid migration through South Delta

Buchanan et al. (2018) studied the survival of emigrating juvenile fall-run Chinook salmon through the lower San Joaquin River and South Delta from 2010 to 2015. They found that survival probability for juvenile Chinook between the study's release point at Durham Ferry and Chipps Island was extremely low through both the mainstem San Joaquin River (ranging between 0 and 4 percent probability of survival) and Old River (ranging between 0 and 11 percent probability of survival). In the wet year of 2011, overall survival probability from Durham Ferry to Chipps Island was only 2 percent, with mortality risk concentrated in the downstream portion of the Delta (i.e., downstream of the Turner Cut junction). In the 6 years studied, over half of the juvenile Chinook surviving through the Delta were salvaged at the Central Valley Project's water export facility and transported for release just upstream of Chipps Island, and thereby avoided transiting the downstream portions of the Delta.

DWR (2013 and 2015) examined the potential for installation of migratory fish guidance structures to reduce diversion of juvenile salmonids to the interior and southern Delta, to reduce exposure to the export pumping facilities of the State Water Project and the Central Valley Project. Among the sites studied was the Head of Old River, where Old River and the mainstem of the San Joaquin River diverge at approximately River Mile 52 of the San Joaquin, approximately five river miles downstream of the existing weir. In 2009 and 2010, a Bio-Acoustic Fish Fence was tested as an engineering solution to prevent outmigrant juvenile salmonids from entering Old River. The results from these 2 years showed no significant difference in the overall proportion of released fish that migrated down the mainstem of the San Joaquin River (ranging from 18.4 to 35.5 percent under various operational conditions and water years) once the results of predation were considered.

5 Needed Technical Studies

Research into needed technical studies focused on the following types of studies:

- Studies that must be performed if the Project as currently defined is to receive necessary permits
- Studies that may be necessary to address local stakeholder concerns
- Studies that may be necessary to fill knowledge gaps or areas of uncertainty pertinent to the Project

5.1.1.1 Feasibility study

While significant progress has been made in defining a Preferred Conceptual Design, as described in Section 3.2 above, more rigorous technical analysis of project alternatives should be conducted for a potential public investment of this magnitude. In addition, recent findings of the technical analysis performed for the CVFPP 2022 Update (conducted since the Preferred Conceptual Design was identified) show a major increase in anticipated flood peaks and risks in the lower San Joaquin Valley – as much as a 400 percent increase in peak flows at Vernalis under the highest climate change scenarios. Such findings suggest the need for additional analysis and quantification of the benefits that various Project alternatives, including larger alternatives, would provide in future decades under such scenarios.

The following issues are among those that should be considered for inclusion in the feasibility study:

- Flood risk reduction benefits of project alternatives under current and anticipated future hydrological conditions, including those estimated by the CVFPP climate change technical analysis
- Re-evaluation as necessary of constraints and opportunities present at the project site, including but not limited to: the routing of overland-flowing waters back into Paradise Cut; the fate of existing structures within the intended overland flow areas; the optimal size of the openings underneath I-5 and the two railroads; the potential repurposing of the RD 2095 levee on the left bank of the San Joaquin between the existing and proposed new weirs; and other topics to be determined.
- Potential for sedimentation and other downstream effects of project alternatives under current and anticipated future hydrological conditions
- The areal extent and depth of channel restoration dredging in the South Delta, including in reaches not within the footprint of the Preferred Conceptual Design
- Effects of various potential channel depth restoration actions on flood risks to levees downstream of Paradise Cut and water quality within the Delta
- Modeling of flow velocity dynamics under all project alternatives and identification of potential measures to prevent, reduce, or armor against velocity spikes
- Assessment of management alternatives for the levee that would remain on the left bank of the San Joaquin River between the new and existing weirs, including analysis of the potential need to maintain the levee to avoid unwanted hydraulic dynamics
- Additional potential restoration actions within or near the current project footprint
- Land acquisition, capital and operation and maintenance costs, and a project financing strategy
- Impact avoidance, minimization and mitigation strategies

5.1.1.2 Sedimentation assessment

It is currently unknown how much additional sediment might be deposited into channels within or downstream of Paradise Cut by the new flows it would receive as a result of bypass and weir expansion. To model this effectively, better information is needed about sediment transport dynamics in the lower San Joaquin River. Ideally, a model of sediment transport in the San Joaquin River would be built and calibrated for use in projecting sediment deposition in future high-flow scenarios. If that is not feasible before engineering design of a Project must be completed, study of the sediment dynamics of past high-flow events should be conducted to identify plausible ranges of potential deposition rates under different flow scenarios for the scoping of any needed mitigation or long-term maintenance strategy to address increased sedimentation (if any) of south Delta channels.

5.1.1.3 Geotechnical analyses

In accordance with the recommendation in Anchor (2021), a geotechnical assessment of the potential impacts of channel restoration activities on adjacent levees and banks should be undertaken, including an analysis of the potential of levee soils to support equipment loads if necessary for channel restoration operations. The best available geotechnical information about South Delta levees, especially those that are not part of the state and federal flood control project (which in this situation includes all levees downstream of the Paradise Cut–Old River confluence and the Preferred Conceptual Design) is held by the local Reclamation Districts that own and maintain those levees. A survey should be conducted to gather all available geotechnical information on these levees for the purposes of characterizing any potential hydraulic impacts of the Preferred Conceptual Design under different flow scenarios. Should any critical information gaps exist, focused geotechnical investigations should be scoped and executed to address them.

5.1.1.4 Establishment of a common modeling basis with other major projects

There are multiple hydraulic models in use to analyze the potential benefits and impacts of major flood management projects in the south Delta, including at least two that have been used to analyze conditions in and near Paradise Cut. Both models are based in data produced by DWR's CVFED program, but they generate different water surface elevations in Paradise Cut for flow events of a given return period (e.g., the 100-year flood). Though it is likely the differences are not highly consequential for flood management planning in the region, it would be desirable for these models to be reconciled so that any future Project and the nearby Mossdale Urban Flood Risk Reduction Project, in particular, are using a common modeling basis. This is especially true given that SJAFCA serves as the lead entity for both projects.

In addition, any model used for Paradise Cut analysis should be reviewed consistently and independently as projects are planned and implemented in the region, and as DWR completes its intended update of its model of the San Joaquin River system to reflect new bathymetry and topographic survey data.

5.1.2 Studies required for permit applications and environmental compliance

The following hydrology and engineering studies would need to be performed to obtain needed permits and environmental compliance documents.

5.1.2.1 Modeling of hydraulic impact of project levee alteration (for 408 permit)

Since the Project would modify federal flood management infrastructure facilities, a permit would be required under Section 14 of the Rivers and Harbors Appropriation Act of 1899, also known as a "Section 408 permit." The Central Valley Flood Protection Board (CVFPB) would initiate the Section 408 process with the USACE after the project proponents had applied to the CVFPB for an encroachment permit.

USACE staff would evaluate the Section 408 permit application to determine (a) whether the Project would impair the usefulness of the federal flood control project in the San Joaquin Valley and (b) whether the Project would be injurious to the public interest. For the former, hydraulic modeling results would be needed to demonstrate to the USACE's satisfaction that the stage changes produced by the Project would not impair the usefulness of the federal flood control project. For the latter, study and documentation may be required to demonstrate that the Project has neutral or positive effects upon water quality, navigation, shore erosion/accretion and recreation.

5.2 Ecosystem needed studies

The Preferred Conceptual Design contains proposals for habitat restoration within and adjacent to the Paradise Cut channel. These include putting agricultural land under easement to protect foraging habitat for Swainson's hawk, restoring native grassland, and restoring riparian habitat within the expanded Paradise Cut channel. Additional technical analyses are needed for three purposes:

- Specification of a final restoration design in the Project that specifically addresses the habitat needs of identified target species
- Examination of the potential for restoration and/or enhancement of aquatic habitat in the South Delta
- Generation of data and documentation needed for permit applications and environmental compliance needs for a formal Project description

These are described in greater detail below.

5.2.1 Specification of a final Project

5.2.1.1 Restoration potential assessment

The Preferred Conceptual Design includes preservation of agricultural land under flowage and/or agricultural easements to protect foraging habitat for Swainson's hawk, restoration of native grassland, and restoration of riparian habitat within the expanded Paradise Cut channel. There are

additional restoration opportunities in the South Delta that could be assessed for potential inclusion in an expanded Project. Sites both adjacent to, and downstream from, the current Paradise Cut project footprint have potential to be restored as mitigation for project impacts, mitigation for the impacts of other projects in the region, or as ecosystem "uplift" beyond the requirements of mitigation agreements.

To assess these opportunities and advance existing restoration concepts to actual restoration design, additional analysis should identify the extent to which the site could provide habitat for specific target species of conservation concern (as identified in the CVFPP CS) in the lower San Joaquin and/or make contributions to the fulfillment of CSMOs in the Lower San Joaquin Valley. This analysis should include consideration of existing agricultural easements in the Project area and whether they present any barriers to habitat restoration. The analysis should also assess the extent to which specific design features that enhance habitat for those species should be incorporated into the final Project. For example, if the site has potential as habitat for the riparian brush rabbit, it may be necessary to ensure that the final Project contains sufficient high-ground refugia to which the rabbits can retreat when high flows arrive.

This restoration potential assessment should include:

- Identification of documented occurrences of target species in the lower San Joaquin region, and the typical movement range of those species
- Analysis of the actual or potential connectivity of the Project site and other potential nearby restoration sites to existing patches of habitat for the species in question
- Overall assessment of the potential for re-inhabitation of the site by each target species, either voluntarily or, if relevant, through intentional human action
- For species where re-inhabitation is judged likely, identification of specific habitat design features that would enhance habitat quality for the species in question
- For additional potential aquatic and riparian restoration sites adjacent and downstream of Paradise Cut, assess restoration potential through comparative analysis of potential native vegetation and native species recruitment and self-reproduction under both existing and conceptual restoration design conditions
- Initial cost estimates for potential restoration actions

5.2.1.2 Agency consultation on potential impacts to migratory fish

As described in Section 4.2.4, focused investigations have been conducted of migratory fish survival through the South Delta, particularly with respect to the comparative fate of juvenile salmonids migrating down Old River and the mainstem San Joaquin. A new weir built as part of the Project would create another point where migratory fish could, in times of high flow, be diverted out of the mainstem San Joaquin and toward South Delta channels.
Any new weir built as part of the Project would only spill on infrequent occasions, likely on the order of one or two high-flow events per decade, at most, as a long-term average. Previous studies have indicated that survival prospects for juvenile salmonids are almost equally poor in the mainstem San Joaquin and Old River migratory pathways. For these reasons, it appears unlikely that the Project as currently contemplated would result in significant new impacts to

migratory fish survival. Nonetheless, early consultation with appropriate regulatory agencies on this issue is likely advisable to ensure that any potential negative effects for migratory salmonids can be anticipated and, if possible, avoided or mitigated in project design.

5.2.1.3 Soil and sediment contamination studies

As noted in Section 4.1.3.1, Anchor (2021, p.9) identified the need for additional testing of soil and sediment samples to confirm that contaminant[5] levels do not preclude potential placement of dredge spoils in landfills, in locations in or near water, or to increase upland elevations of dry land and marshes. This testing is likely additional to the Phase I environmental assessment (see Section 5.2.2.5).

5.2.2 Studies required for permit applications and environmental compliance

Certain surveys and studies are required to support permit applications and environmental compliance documents prepared under CEQA and NEPA. These are described briefly below.

5.2.2.1 Wetland delineation study

An aquatic resources delineation (commonly known as a "wetlands delineation") must be performed within the Project footprint to identify and document the boundaries of potential waters of the United States. The report resulting from this effort should provide sufficient information to support a Preliminary Jurisdictional Determination by USACE under Section 404 of the Clean Water Act, which regulates the discharge of dredged or fill material into waters of the United States.

5.2.2.2 Biological resources study

A study of sensitive biological resources, including the potential presence of special-status species and habitats, must be performed to support CEQA/NEPA review of the Project, as well as provide information pertinent to the preparation of Biological Assessments and Incidental Take Permit applications that may be required under the federal and state Endangered Species Acts.

5.2.2.3 Cultural resources study

A study of cultural resources in the Project area must be performed and would include at least two basic components: (1) a records search in the California Historic Resources Information System and any other pertinent databases known to identify cultural resources within the Area of Potential Effect (APE) of the Project, in order to assist in the development of a description of the historic context, and (2) a pedestrian survey to identify any cultural resources present on the land surface within the APE. Depending upon the findings of these two steps, a subsurface investigation of potential cultural resources could be deemed necessary in areas in which soil excavation may occur as part of the Project. The findings of these investigations would be used to support CEQA/NEPA assessment of potential project impacts, tribal consultation requirements

[5] Tests were performed for trace metals, sulfide, pesticides, polychlorinated biphenyl (PCB) cogeners, polycyclic aromatic hydrocarbons (PAHs), and methyl mercury.

under California Assembly Bill 52, and compliance with Section 106 of the National Historic Preservation Act.

5.2.2.4 Air quality and greenhouse gas emissions impact study

As part of environmental compliance efforts under CEQA and NEPA, air quality and greenhouse gas (GHG) emissions impacts must be analyzed. Given the air quality challenges of the Central Valley and the potential for significant impacts from the construction of a major infrastructure project, it may be advisable to conduct an analysis of potential air quality and GHG impacts of the Project during the early design phases to identify feasible means of avoiding or reducing these impacts. This analysis should include identification of regional and local attainment status for all criteria air pollutants, identification of sensitive receptors that may be located near proposed construction sites, estimation of short-term construction-related and long-term operation-related emissions, and assessment of the adequacy of the air quality analysis as it relates to health impacts.

5.2.2.5 Phase I environmental assessment

A Phase I Environmental Site Assessment should be performed to identify potential or existing environmental contamination liabilities. The assessment should cover both the underlying land as well as the physical improvements to the properties where construction of levees would occur.

6 Potential Funding Sources

The next steps of planning for the Project are anticipated to be funded by a $3 million grant from DWR's Systemwide Flood Risk Reduction Program to SJAFCA in the winter of 2022-23. The following sections describe some potential additional funding sources for all stages of Paradise Cut implementation, including planning, land acquisition, dredging, construction, revegetation, and monitoring.

At the time of this writing, a significant amount of federal and state money is available for reducing flood risk and restoring floodplain habitat in the United States and in the Central Valley. Large state budget surpluses in FY 2021-22 and 2022-23, as well as the $1.2 trillion federal Infrastructure Investment and Jobs Act (IIJA) of 2022, may make billions of dollars available for improving California's flood management infrastructure in the coming years. However, it is difficult to anticipate with precision how much money may be available in any of the programs listed below in future fiscal years, as funding allocations are generally determined on a year-by-year basis, economic and fiscal conditions are continually changing, and the precise timing of specific project funding needs is not yet firmly established. The descriptions below are therefore meant to provide an overview of potentially relevant sources worthy of further investigation as the Project advances, and funding amounts (where indicated) are meant to provide a general sense of the magnitude of potentially available resources within a given program.

6.1 Federal funding sources

The following federal programs have potential to provide funding for Paradise Cut.

6.1.1 Federal Emergency Management Agency Building Resilient Infrastructure and Communities (BRIC)

The Federal Emergency Management Agency (FEMA) provides large-scale grant funding through the Building Resilient Infrastructure and Communities (BRIC) Program for projects that build community resilience and prevent or reduce risks from future natural disasters, including floods. A variety of eligibility criteria, including attainment of a specific benefit-cost ratio under FEMA's benefit-cost assessment method, must be met to qualify for BRIC funding. The California Governor's Office of Emergency Services is the agency designated to submit funding applications to BRIC on behalf of sub-applicants in California.

- *Available funding*: The IIJA appropriated $1 billion per year over 5 years for a total of $5 billion. At the time of this writing, individual BRIC awards are capped at a maximum of $50 million.
- *Cost share*: FEMA's non-federal cost share is 10 percent maximum.
- *Limitations*: SJAFCA does not qualify for FEMA funding.

6.1.2 National Oceanic and Atmospheric Administration Transformational Habitat Restoration and Coastal Resilience Grants

This grant funding will "prioritize habitat restoration actions that rebuild productive and sustainable fisheries, contribute to the recovery and conservation of threatened and endangered species, use natural infrastructure to reduce damage from flooding and storms, promote resilient ecosystems and communities, and yield socioeconomic benefits."

- *Funding area*: NOAA only funds projects in coastal watershed counties – counties located along inland rivers and streams with a significant impact on coastal and ocean resources. San Joaquin County is considered a coastal watershed county.
- *What it funds*: Planning and assessments; feasibility studies; engineering design and permitting; on-the-ground implementation; pre- and/or post-implementation monitoring; or any combination of phases thereof. Proposals may also include capacity-building and stakeholder engagement to support the proposed restoration.

6.1.3 National Fish and Wildlife Foundation America the Beautiful Challenge

National Fish and Wildlife Foundation is consolidating grant funding from the private sector and multiple federal agencies (the Department of the Interior, Department of Defense, and the Department of Agriculture's U.S. Forest Service and Natural Resources Conservation Service) to develop large-scale, locally led conservation and restoration projects, including projects that

conserve and restore rivers, wetlands, and watersheds and improve ecosystem and community resilience to flooding.

- *Available funding*: $85 million available in 2022 (year one); future years to be determined

6.1.4 FEMA STORM Revolving Loan Fund Program

FEMA's STORM Program provides capitalization grants to states to make funding decisions and award loans directly to local communities and local governments to increase resilience and reduce risks from natural hazards and disasters such as floods.

- *Available funding*: The IIJA appropriated $100 million per year over 5 years for a total of $500 million.
- *Eligible projects*: Zoning and land-use planning, wildland-urban interface management, conservation areas, reconnection of floodplain, and open space projects.
- *How it works:* The state contributes 10 percent of the grant into an established entity loan fund. The entity loan fund provides assistance to the local government to reduce flood risk. The local government repays the loan.

6.2 State funding

The following state programs have potential to provide funding for Paradise Cut. Several are administrated by DWR.

6.2.1 DWR Systemwide Flood Risk Reduction Program

The Systemwide Flood Risk Reduction Program oversees the work necessary to develop and implement Delta and Central Valley multi-benefit flood risk reduction and habitat restoration projects that further the goals and objectives of the CVFPP and other systemwide priorities identified by Governor Newsom or the Legislature. The State may improve the system through direct investment in new or improved facilities for the State Plan of Flood Control or through proposal solicitations. The Systemwide Flood Risk Reduction Program is providing $3 million to SJAFCA to carry out the next phase of planning work for the Project.

- *Eligible projects:* Program activities may include development of feasibility studies, technical studies, preliminary and final flood system designs, construction documents and specifications, and other memorandums and reports.

6.2.2 DWR Floodplain Management, Protection, and Risk Awareness Grant Program

This is a competitive grant program that supports local agency efforts to prepare for flooding by providing financial assistance for flood risk reduction activities related to stormwater flooding, mudslides, and flash floods.

- *Status*: $50 million was awarded in 2022; future allocations to be determined

6.2.3 DWR Urban Flood Risk Reduction Program

The Urban Flood Risk Reduction Program works to improve flood protection for urban areas (greater than 10,000 residents) associated with the State Plan of Flood Control facilities. The program partners with local flood control agencies, helps guide the development of flood risk reduction projects, and uses state funds to cost-share on design, real estate, and construction activities.

- *Status*: Future allocations to be determined

6.2.4 DWR Delta Levees Special Flood Control Projects

This program provides financial assistance for flood protection in the Delta and safeguarding public benefits, including roads, utilities, urbanized areas, water quality, recreation, navigation and fish and wildlife from flood hazards. The program mitigates the habitat impacts of each project and ensures a net long-term habitat improvement in the Delta.

- *Eligible applicants*: Local Maintaining Agencies, Reclamation Districts, and other government agencies responsible for levees in the Delta.

6.2.5 DWR Flood Corridor Program

This program provides grant funding to proponents of nonstructural flood management projects throughout the state that include wildlife habitat enhancement and/or agricultural land preservation.

- *Status*: Funding provided by Prop 84 and Prop 1E, passed in 2006.

6.2.6 California Wildlife Conservation Board Competitive Grants

The California Wildlife Conservation Board (WCB) runs a competitive grant program that has a significant amount of money to fund land acquisition, habitat restoration, and public recreational access projects across California. The WCB is authorized to acquire land on behalf of the California Department of Fish and Wildlife and award grants for fish and wildlife habitat conservation, restoration, and for development of compatible public access facilities.

- *Available funding*: Over $719 million as of August 25, 2022; future years to be determined.

6.2.7 California Infrastructure Plan

The California Infrastructure Plan could include money for flood control facilities, possibly including Paradise Cut, if Senate Bill (SB) 1253: Infrastructure Plan Modification (California State Senator Melissa Melendez, Riverside County) becomes law. SB 1253 is a proposed bill that would update the California Infrastructure Plan to include investments in the State Plan of Flood Control for flood control facilities in other areas of the state. The governor is required to submit a 5-year infrastructure plan each January with the proposed state budget. The plan does not currently include funding for flood control infrastructure.

6.3 Mitigation

If the Project were to create sufficiently large restoration areas of the appropriate kind and beyond that which may be needed to mitigate for the project's own impacts, it may be feasible to sell mitigation credits to outside parties in need of them. The following two programs could be of use in that endeavor. In addition, coordination with San Joaquin County's Multispecies Habitat Conservation Plan may be desirable to identify mutually beneficial opportunities for providing mitigation acreage.

6.3.1 National Fish and Wildlife Foundation Sacramento District California In-Lieu Fee Program

In-Lieu Fee (ILF) projects must be located in a designated priority service area and must provide benefits to aquatic resources. The ILF program offers permittees an in-lieu fee option to satisfy required mitigation obligations for impacts to aquatic resources (wetlands and vernal pools), as determined by regulatory agencies. The ILF program offers two types of credits for aquatic resource (wetland) and vernal pool credits.

- *Funding area:* The Program Area covers the geographic area under the jurisdiction of the USACE Sacramento District. The Program Area is divided into 17 "Aquatic Resource Service Areas" and 12 "Vernal Pool Service Areas." Paradise Cut is in the Calaveras/Stanislaus Rivers Aquatic Resource Service Area.
- *Available funding*: $13.4 million total and $1,206,000 as of August 2022 for the Calaveras/Stanislaus Rivers Service Area.
- *Eligible applicants*: Non-profit organizations, U.S. Federal Government agencies, state government agencies, local government agencies, Native American tribal entities, educational institutions, and private businesses.

6.3.2 US Department of Agriculture Natural Resources Conservation Service Wetland Mitigation Banking Program

The Wetland Mitigation Banking Program (WMBP) is a competitive grant program that supports the development and establishment of wetland mitigation banks to make credits available for agricultural producers.

- *Eligibility:* Local and state governments, Native American tribal government entities, special districts, institutions of higher education, nonprofits, and for-profit organizations.
- *What it funds:* Awardees may use WMBP funding to support mitigation bank site identification, development of a mitigation banking instrument, site restoration, land surveys, permitting and title searches, and market research. WMBP funding cannot be used to purchase land or a conservation easement.
- *Available funding:* USDA awarded $5 million to the WMBP.

6.4 Other potential funding structures

Innovative funding structures such as those described below may also be of use to the Project.

6.4.1 Pay for Performance

The Pay for Performance model was developed and used by Ecosystem Investment Partners (EIP) to leverage private capital to restore Lookout Slough in Solano County, California, before getting reimbursed by DWR. DWR contracted EIP to restore Lookout Slough to provide habitat for the Delta smelt and create 40,000 acre-feet of flood storage by expanding flood conveyance capacity on the Yolo Bypass as mitigation for the operation of the State Water Project. There may be a similar opportunity for Paradise Cut.

6.4.2 Carbon Sequestration

There may be an opportunity to restore Paradise Cut based on the environmental asset provided by restoration of habitat or creation of a flood bypass. For example, the soil in the expanded bypass lands at Paradise Cut may sequester carbon and be eligible for carbon credits, which can be bought and sold. The Earth Partners is one company that identifies revenue and investment opportunities, including carbon credits, for large-scale restoration projects.

6.4.3 Environmental Impact Bonds

There may be an opportunity for the flood risk reduction benefits at Paradise Cut to attract private investors to invest in the financial benefits of reducing flood risk for downstream residents. For example, Blue Forest Conservation raised $4 million from private foundations and insurance companies for a Forest Resilience Bond to restore 15,000 acres of the North Yuba River Watershed. The bond was repaid by agencies benefiting from the restored watershed including the Yuba Water Agency, Cal Fire and the US Forest Service and investors received 2.5% in interest on the bond.

7 Conclusions

This report is intended to summarize relevant information on the existing technical studies that have been performed on and near Paradise Cut, as well identify needed studies that have not yet been performed and potential funding sources. These include additional studies that are needed to further specify the engineering, hydraulic, and restoration components of the Project, along with studies that will be needed to obtain necessary permits.

A key next step will be a feasibility study that can systematically assess the likely performance of potential Project alternatives under both existing and anticipated future conditions, including the new estimations of potential future flood flows on the lower San Joaquin River produced by DWR in the 2022 CVFPP. Specification of a preferred alternative will enable additional fundraising from state and federal sources, development of engineering and restoration designs, and, once those designs have reached a sufficient level of refinement, commencement of the CEQA process and other permitting efforts.

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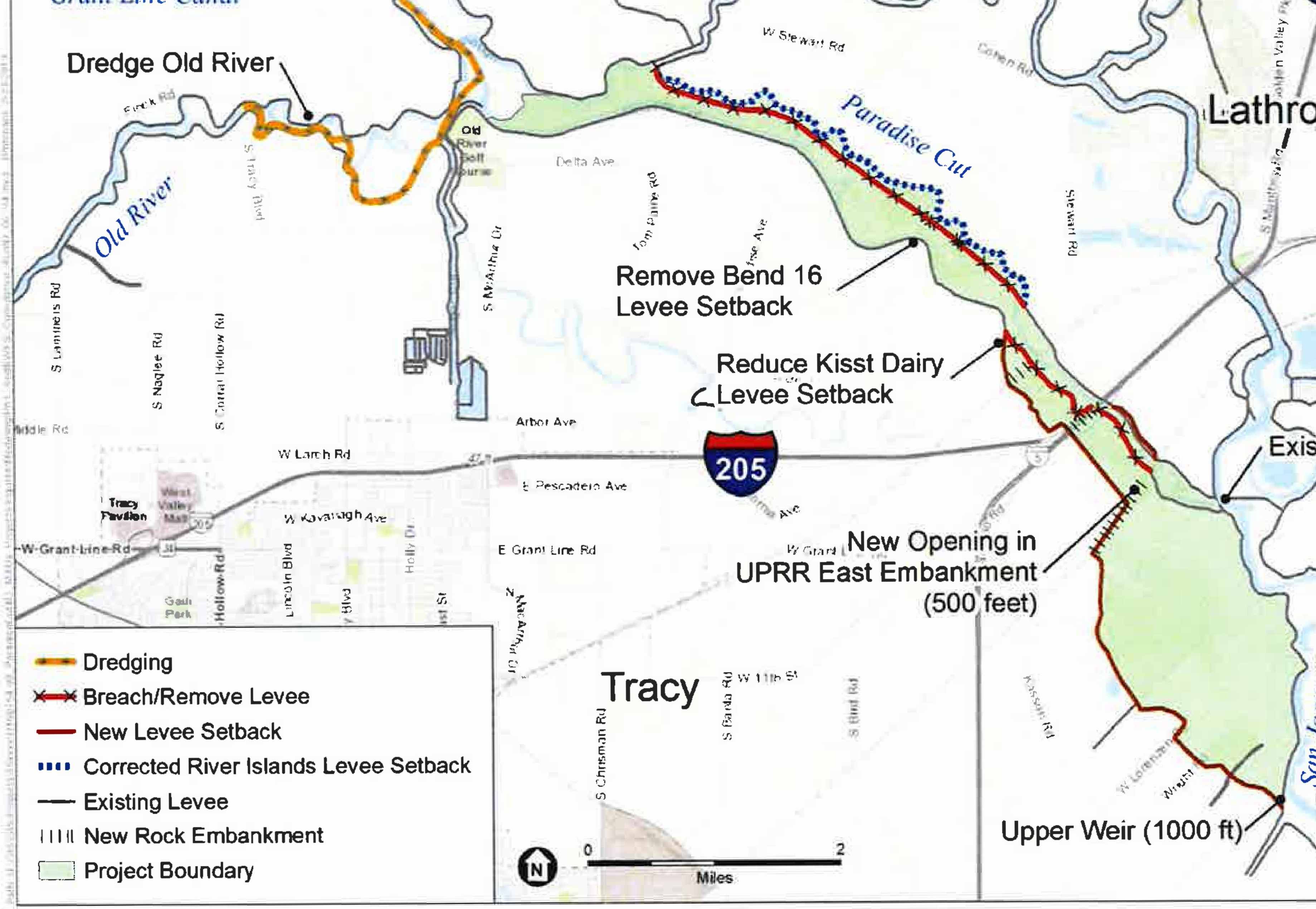
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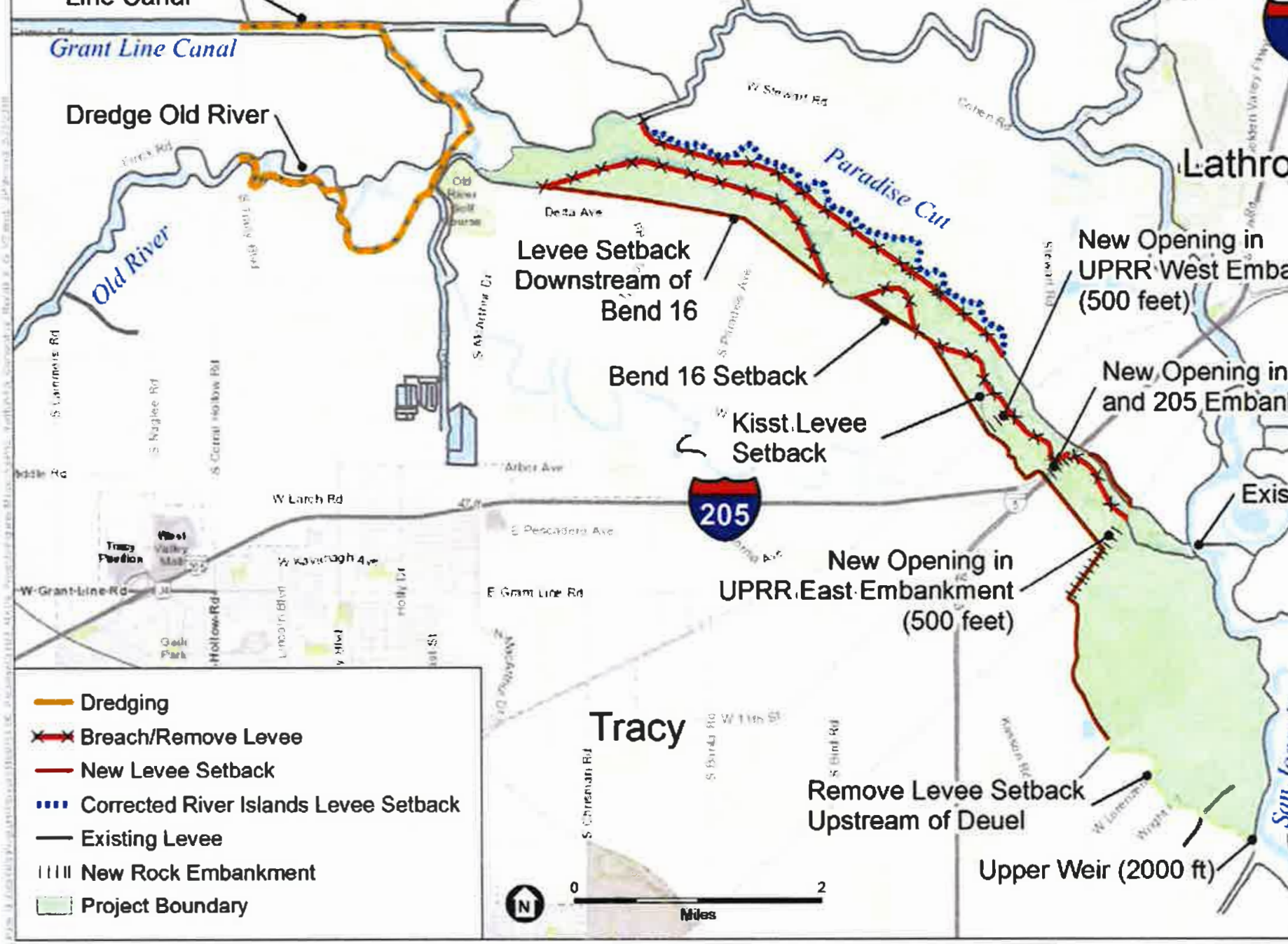
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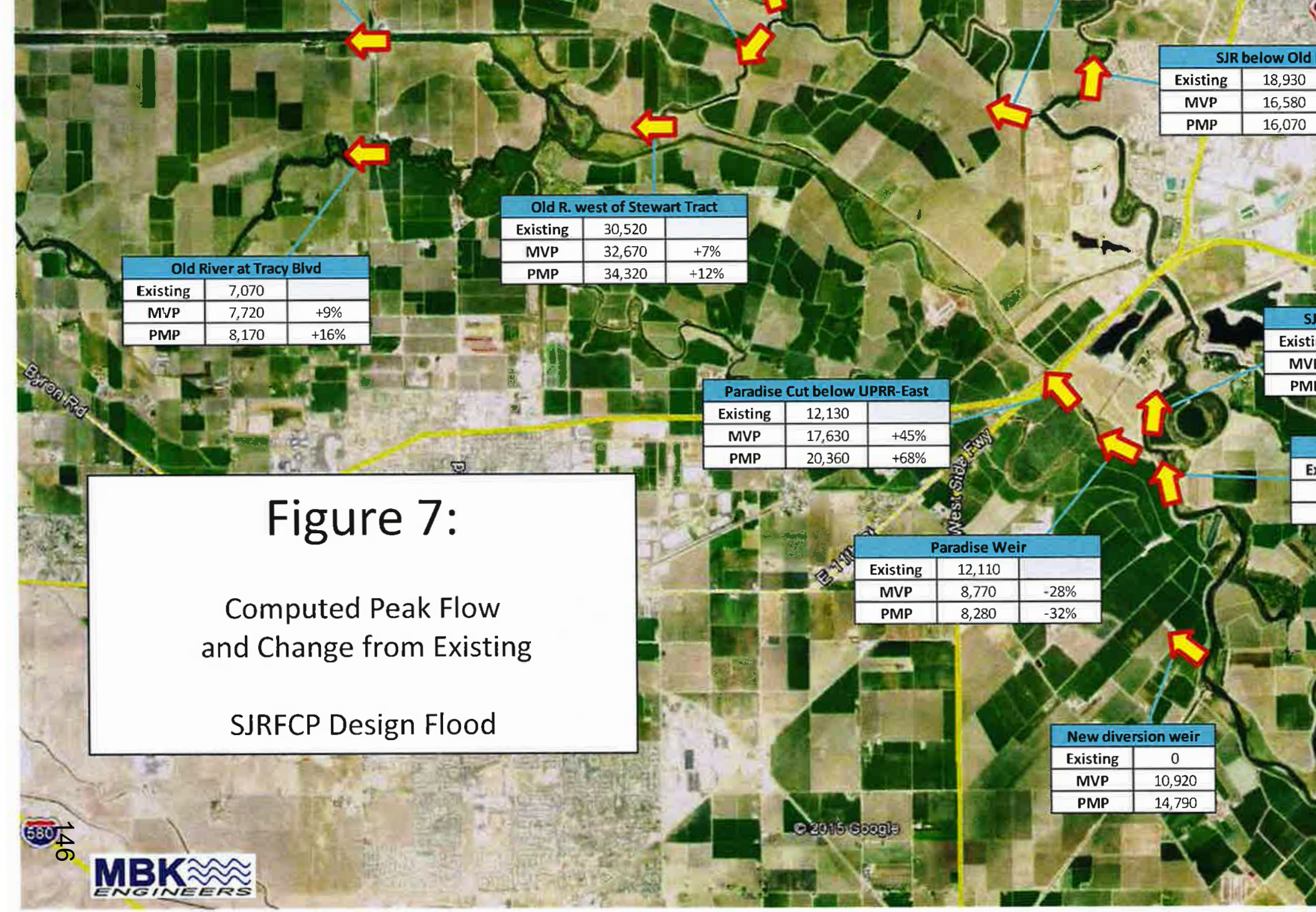
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MVP 17,630 +45%
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Figure 7:
Computed Peak Flow
and Change from Existing
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MBK ENGINEERS

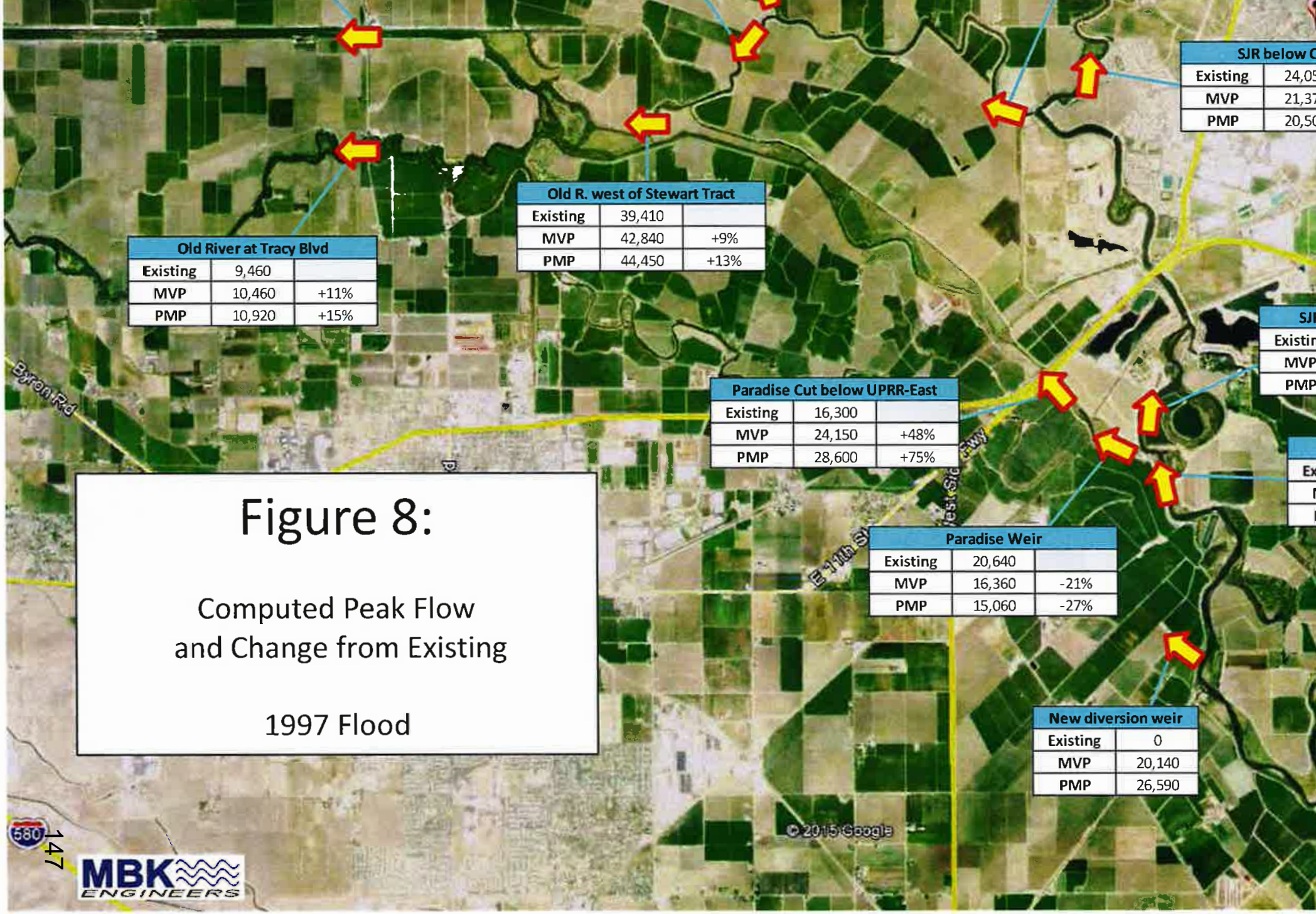

Figure 8:

Computed Peak Flow
and Change from Existing

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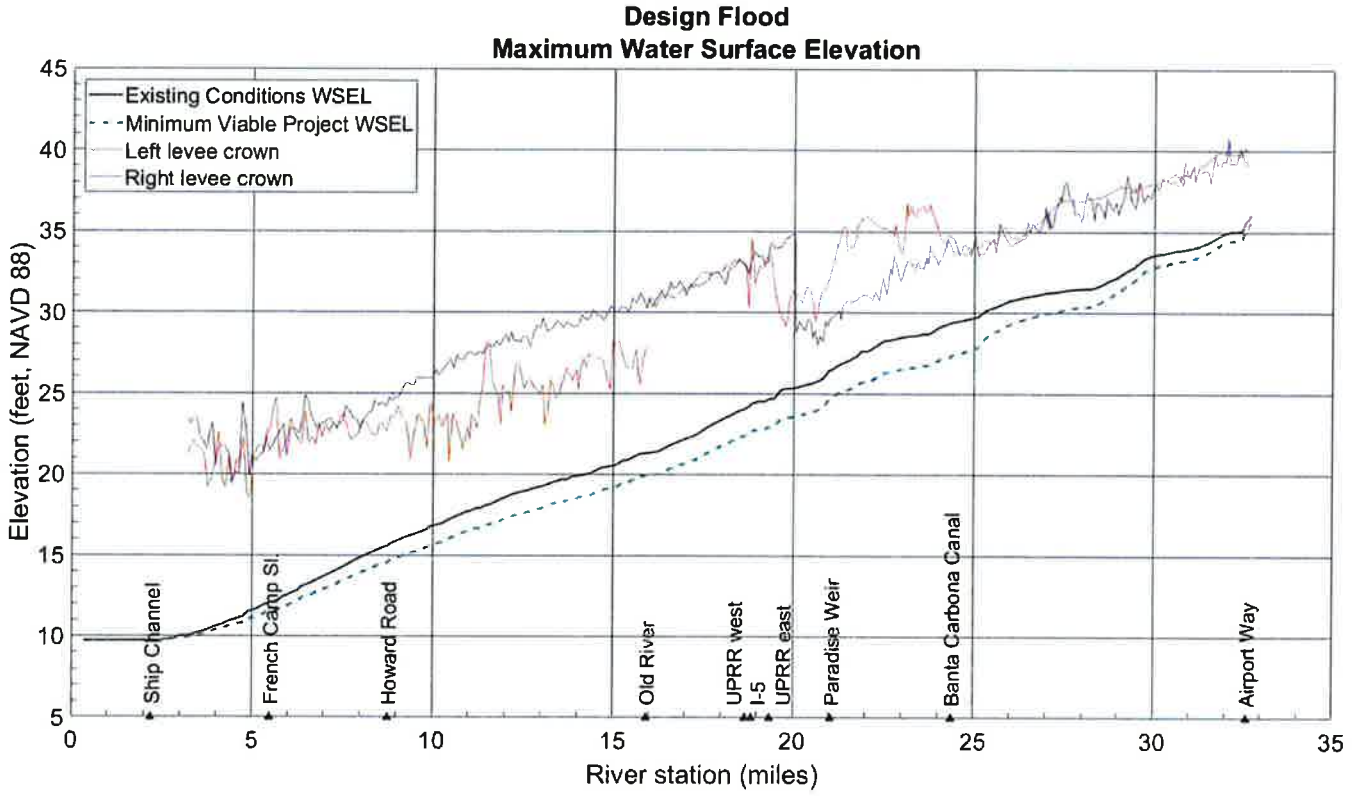
Chart 23: Top of Levees
Minimum Viable Project vs Existing Conditions
San Joaquin River



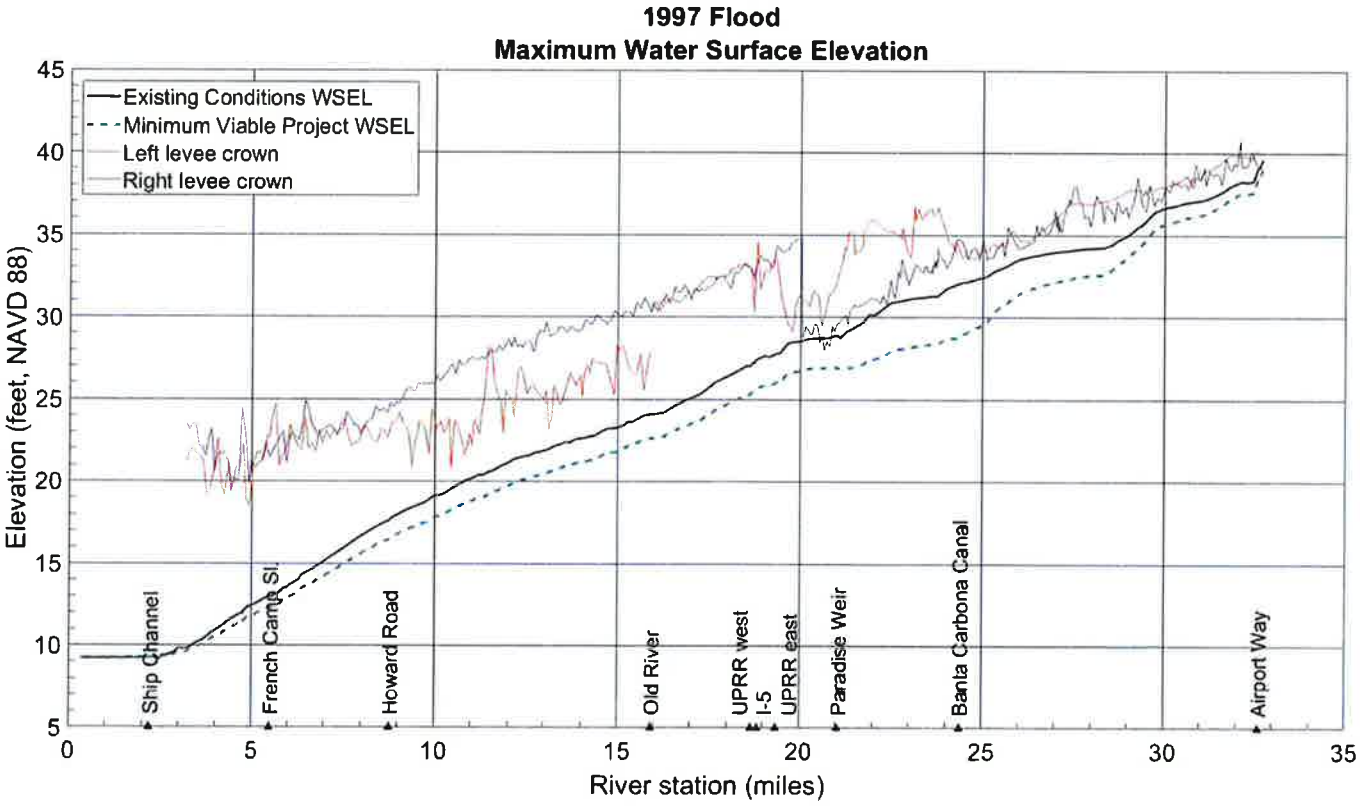


Chart 24: Top of Levees
Minimum Viable Project vs Existing Conditions
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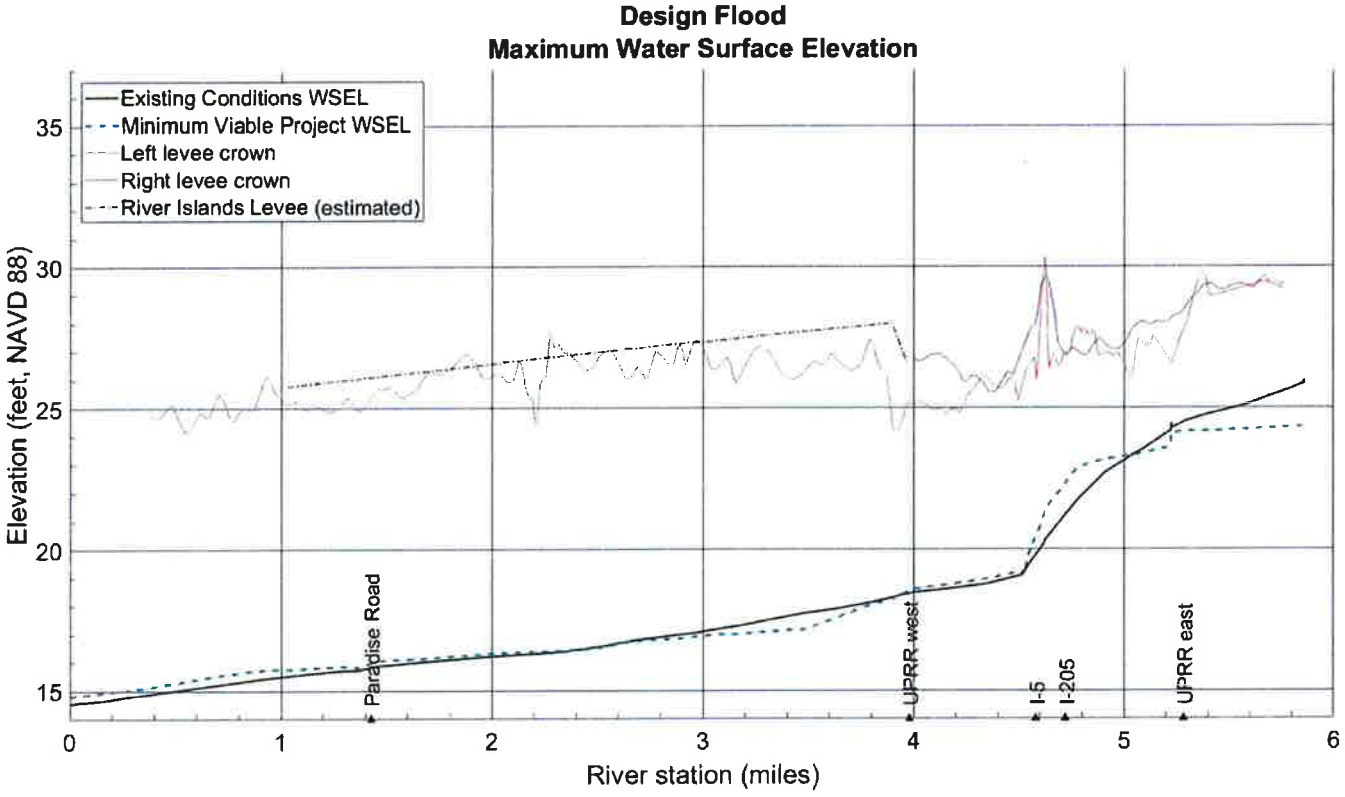


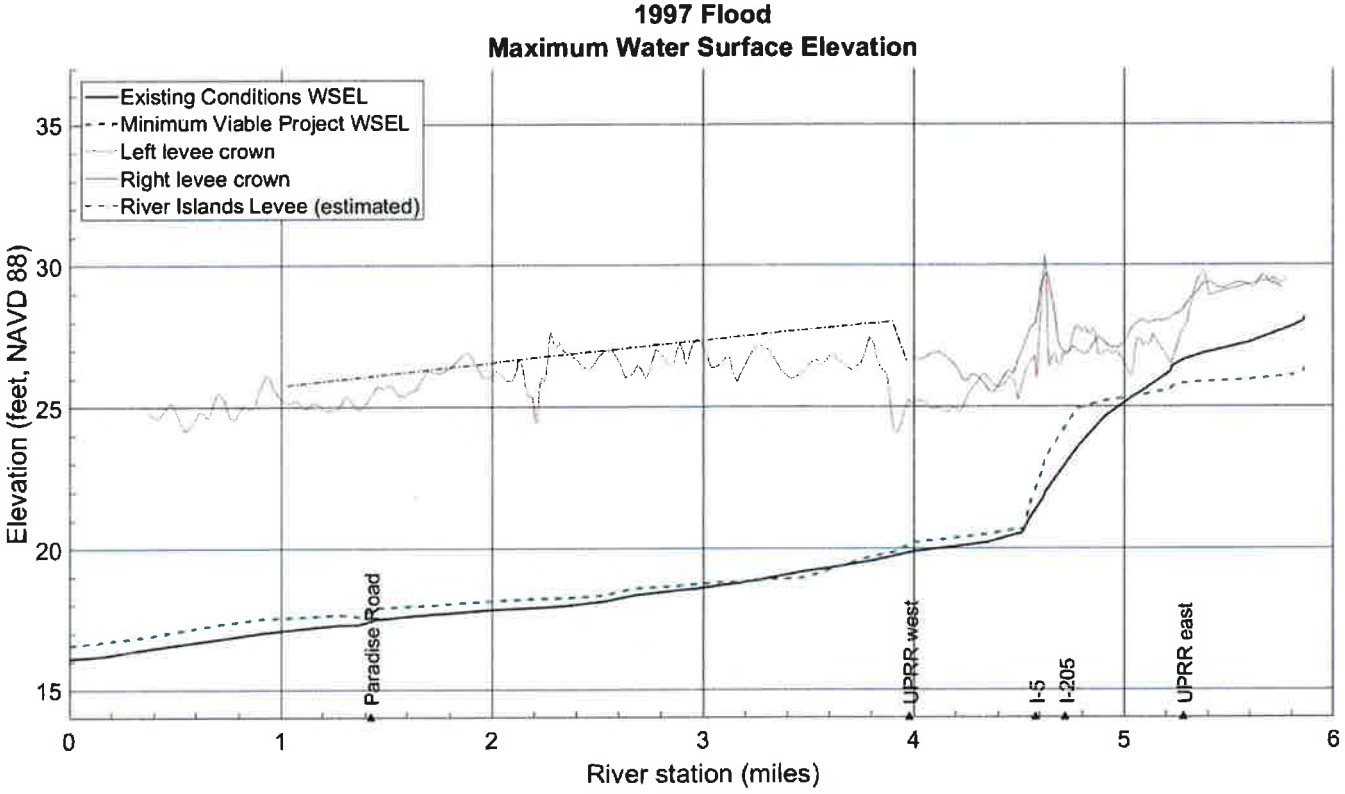
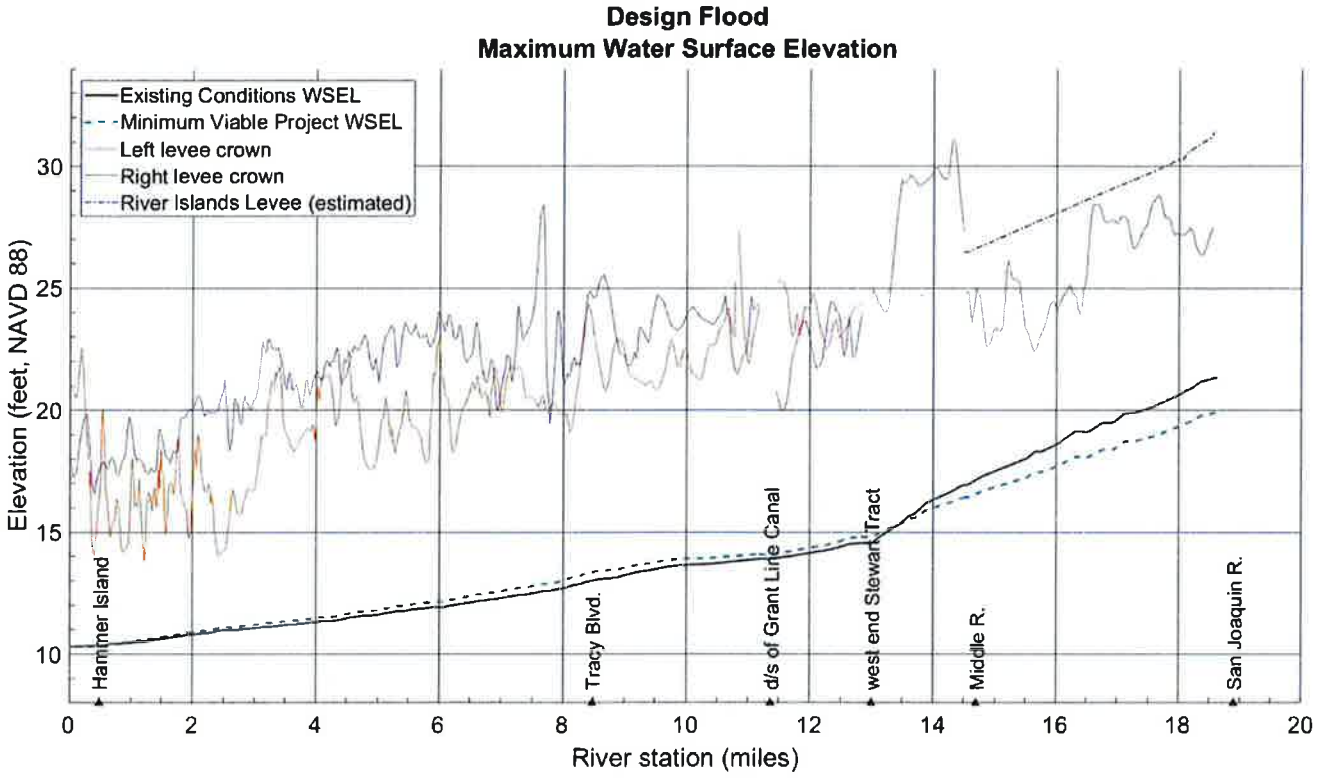


Chart 25: Top of Levees
Minimum Viable Project vs Existing Conditions
Old River



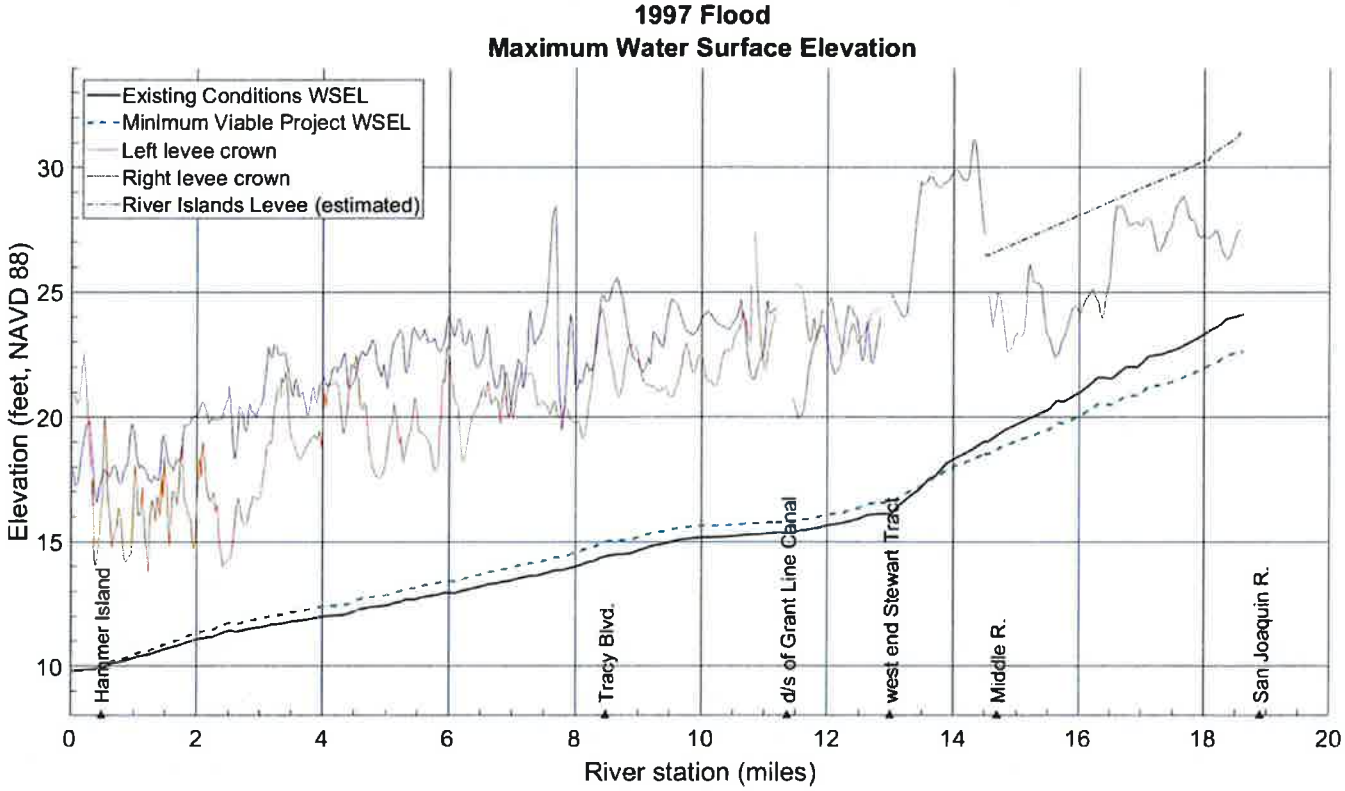
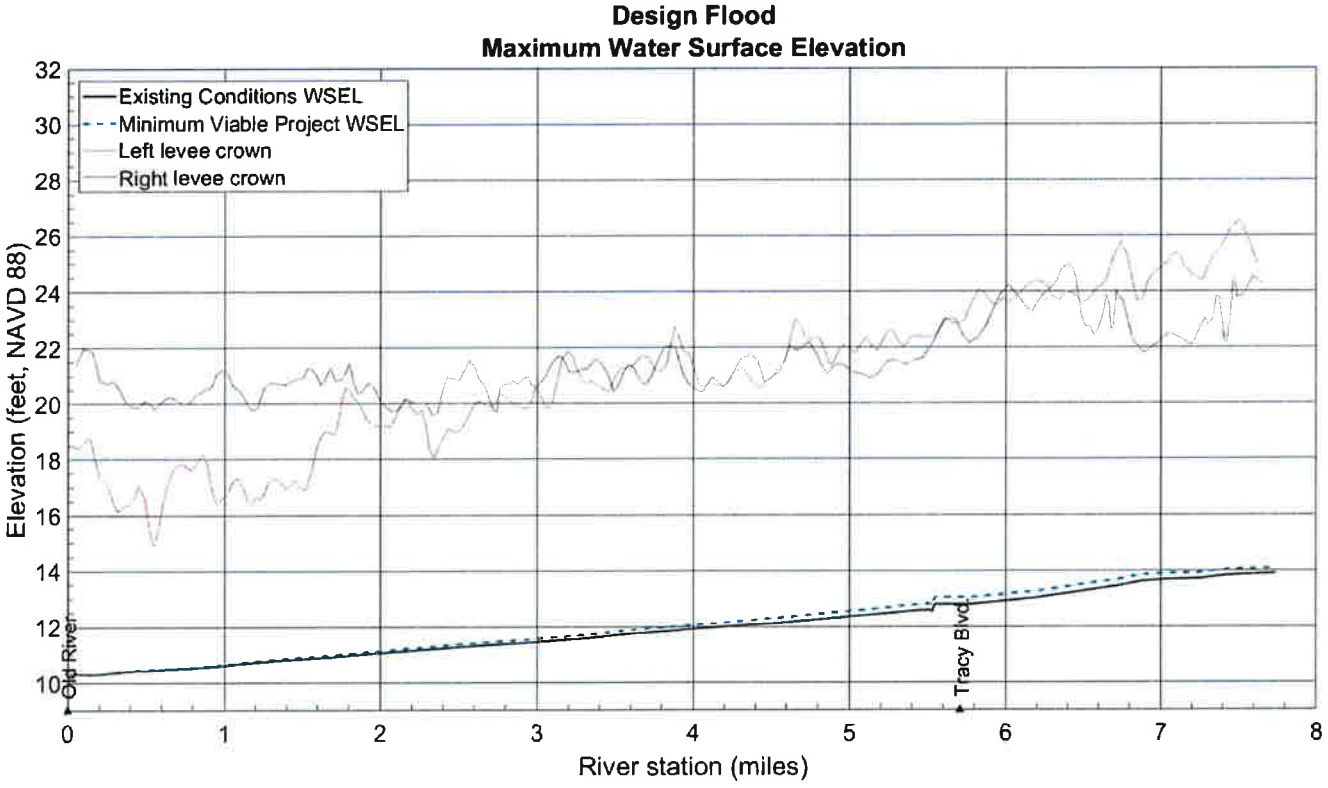
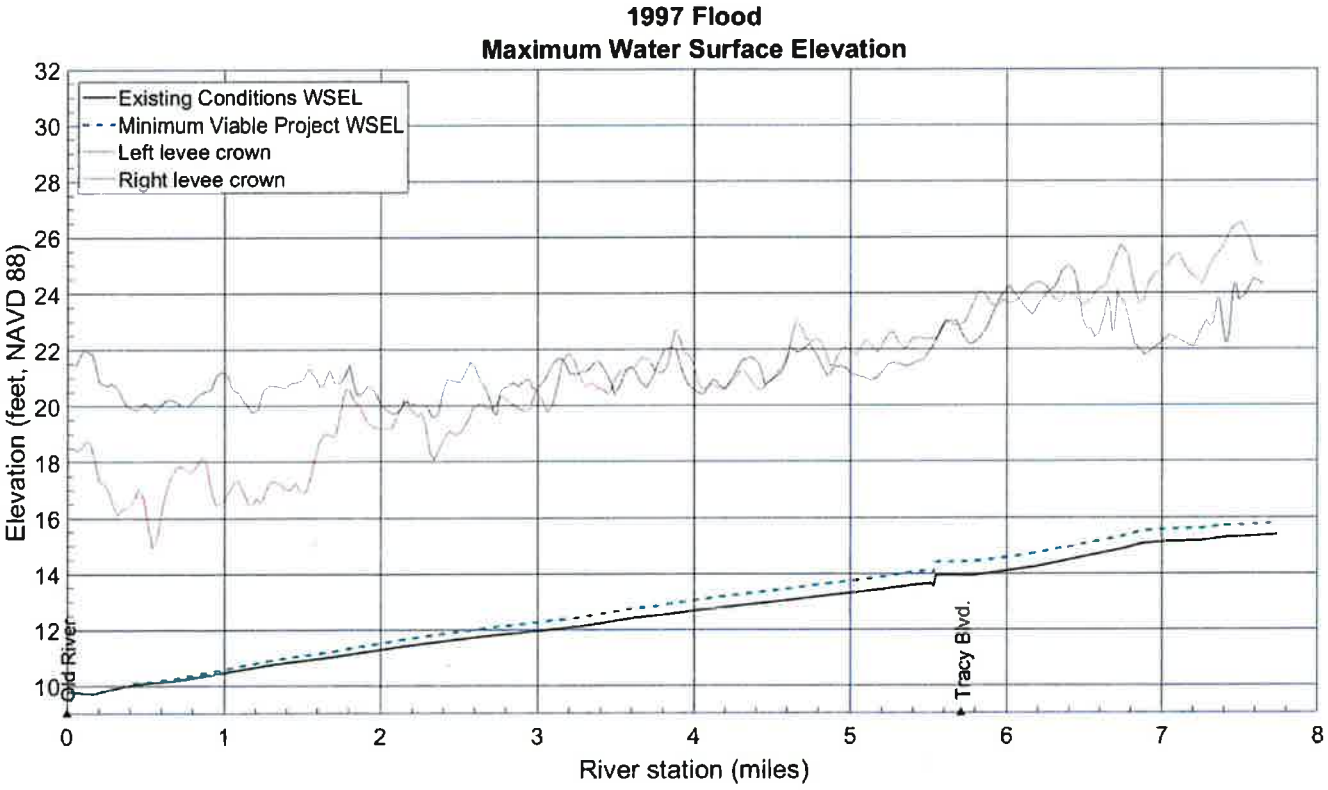


Chart 26: Top of Levees
Minimum Viable Project vs Existing Conditions
Grant Line Canal





ITEM 8

RECLAMATION DISTRICT 773
RESOLUTION 2023-02

RESOLUTION APPROVING AND AUTHORIZING EXECUTION OF DELTA LEVEE MAINTENANCE SUBVENTIONS PROGRAM WORK AGREEMENTS FOR FISCAL YEAR 2023-2024

WHEREAS, the Board of Trustees ("Board") of Reclamation District 773 ("District") has reviewed, and desires to enter into, that certain Delta Levee Maintenance Subventions Program Work Agreements for Fiscal Year 2023-2024, ("Agreement") between the District and the Reclamation Board of the State of California ("Reclamation Board");

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. The Agreement is approved, and the President of the Board or District Secretary is authorized and directed to execute the Agreement, and cause it to be presented to the Reclamation Board with a certified copy of this Resolution.

PASSED AND ADOPTED by the Board of Trustees of Reclamation District 773 at a meeting thereof held on April 4, 2023, by the following vote:

AYES: ____
NOES: ____
ABSENT: ____
ABSTENTION: ____

_____
Trustee, Board of Trustees

ATTEST:

_____
Secretary, Board of Trustees

CERTIFICATION

I ANDY PINASCO, Secretary of Reclamation District 773, do hereby certify that the foregoing is a full, true and correct copy of a resolution of Reclamation District 773, duly passed and adopted at a meeting of the Board of Trustees thereof held on the 4th day of April, 2023.

Dated:_____, 20__

_____
ANDY PINASCO, Secretary
Reclamation District 773

ITEM 9

RECLAMATION DISTRICT 773

RESOLUTION 2023-03

RESOLUTION AUTHORIZING AND DIRECTING FILING OF NOTICE OF EXEMPTION FOR ROUTINE MAINTENANCE, FOR FISCAL YEAR 2023-2024

WHEREAS, the Board of Trustees ("Board") of Reclamation District 773 ("District"), in conjunction with, but not limited to, that certain anticipated Delta Levee Maintenance Subventions Program Work Agreement Fiscal Year 2023-2024 ("Agreement"), between the District and the Central Valley Flood Protection Board of the State of California ("Protection Board") has determined that the work described therein consists of routine maintenance to existing levee improvements;

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. All repair of wave wash and erosion protection, all levee crown restoration which is not in excess of the 100 year flood elevation plus (2) two feet and all levee section restoration including adding material to back slopes, construction of toe berms and construction of seepage berms, drains and other measures to control seepage exit gradients to less than 0.5 and including the work described in the Fiscal Years 2023-2024 Delta Levee Subventions Program Applications consists of routine maintenance to existing levee improvements and falls within the categorical exemptions to the California Environmental Quality Act pursuant to Section 15301 (Class I) of the Guidelines for the California Environmental Quality Act, California Administrative Code of Regulations, Title 14, Chapter 3, Article 19.

2. The District finds the proposed work will not have a material adverse effect upon the environment.

3. That said work does not constitute an exception to the exemptions of the California Environmental Quality Act.

4. That Christopher H. Neudeck is hereby directed to prepare and file with the County Clerk of San Joaquin County for posting, a "Notice of Exemption" pursuant to California Administrative Code, Title 14, Chapter 3, Section 15062.

PASSED AND ADOPTED by the Board of Trustees of Reclamation District 773, at a meeting thereof, held on April 4, 2023, by the following vote:

AYES:

NOES:

ABSENT:

ABSTENTION:

RECLAMATION DISTRICT 773
A Political Subdivision of the
State of California

By:_____
TRUSTEE

ATTEST:

_____
SECRETARY

CERTIFICATION

I, _____, Secretary of Reclamation District 773, do hereby certify that the foregoing is a full, true and correct copy of a resolution of Reclamation District 773 duly passed and adopted at a meeting of the Board of Trustees thereof held on the 4th day of April, 2023.

Dated: _____, 20__

_____
SECRETARY, Reclamation District 773

ITEM 11

RD 773: MASTER CALENDAR

JANUARY

FEBRUARY

- Send out Form 700s, remind Trustees of April 1 filing date
- Board Meeting
- Insurance renewal. Policy renews April.

MARCH

- Hire Employees for Seasonal Levee Work.

APRIL

- April 1: Form 700s due
- Board Meeting

MAY

- Draft Budget

JUNE

- Approve Audit Contract for expiring fiscal year
- Adopted Annual Budget
- Board Meeting
- Adopt Resolution for setting Assessments and submit to County Assessor's Office
- Adopt Annual CEQA Exemption for levee maintenance.

JULY

AUGUST

- August 1: Deadline to certify assessments for tax-roll and deliver to County (duration of current assessment: Indefinite).
- Send handbills for collection of assessments for public entity-owned properties
- In election years, opening of period for secretary to receive petitions for nomination of Trustees (75 days from date of election.) (*Cal. Wat. Code* §50731.5)
- Board Meeting

SEPTEMBER

- In election years, last legal deadline to post notice that petitions for nomination of Trustees may be received (7 days prior to close of closure.) (*Cal. Wat. Code* §50731.5).
- In election years, closing of acceptance of petitions for nomination of Trustees (54 days from date of election.) (*Cal. Wat. Code* §50731.5).
- Insurance Renewal

OCTOBER

- Publish Notice of Election, odd numbered years (once per week, 4 times, commencing at least 1 month prior to election).
- Board Meeting

NOVEMBER

- Election: to be held first Tuesday after first Monday of each odd-numbered year.

DECEMBER

- New Trustee(s) take office, outgoing Trustee(s) term(s) end on first Friday of each odd-numbered year.
- Board Meeting

Term of Current Board Members:

Name	Term Commenced	Term Ends
Ryan Bacchetti	First Friday 12/2021	First Friday of 12/2023
Joe Enos	First Friday 12/2019	First Friday of 12/2023
Mark R. Bacchetti	First Friday 12/2019	First Friday of 12/2023

No Expiration on Assessment

Trustee Ryan Bacchetti appointed to fill vacancy within first half of term. Second half of term expiring in 2025 will be filled at District's 2023 General Election.

ITEM 12

RECLAMATION DISTRICT 773
Bills for Approval of Payment
April 4, 2023 Board Meeting

NAME	INVOICE DATE	INVOICE #	AMOUNT	TOTAL $	WARRANT #	CHECK #	RATIFICATION
Neumiller & Beardslee	2/28/2023	338392	$1,456.15				
	3/15/2023	339176	$1,603.90				
				$3,060.05			
Kjeldsen, Sinnock & Neudeck	1/31/2023	34525	$844.00				
	1/31/2023	34529	$568.75				
	1/31/2023	34530	$56.12				
	1/31/2023	34531	$108.75				
	1/31/2023	34532	$20,368.11				
	1/31/2023	34533	$370.00				
	1/31/2023	34534	$322.50				
	2/28/2023	34761	$1,789.76				
	2/28/2023	34762	$456.25				
	2/28/2023	34763	$123.75				
	2/28/2023	34764	$9,446.25				
	2/28/2023	34765	$9,266.25				
	2/28/2023	34766	$383.75				
	2/28/2023	34767	$157.50				
				$44,261.74			
Custom Spraying, Inc.	2/15/2023	11-2411	$5,000.00				
				$5,000.00			
BPM	1/24/2023	53731	$27.00				
				$27.00			
NOTES:			**Warrant Total**	**$52,348.79**			
Fund Balance as of December 31, 2022		$376,323.84					
Less Submitted Warrants for Payment:		$52,348.79					
Total:		**$323,975.05**					
Bank of Stockton Balance as of 12/31/22		$31,238.30					
		$355,213.35					

RECLAMATION DISTRICT 773
Bills for Approval of Payment
February 7, 2023 Board Meeting

NAME	INVOICE DATE	INVOICE #	AMOUNT	TOTAL $	WARRANT #	CHECK #	RATIFICATION
Neumiller & Beardslee	12/12/2022	335708	$1,789.79				
				$1,789.79	2066		
Kjeldsen, Sinnock & Neudeck	1/13/2023	34363	$865.53				
	1/13/2023	34364	$653.87				
	1/13/2023	34365	$160.04				
	1/13/2023	34366	$45.00				
	1/13/2023	34367	$2,247.50				
	1/13/2023	34368	$7,556.25				
	1/13/2023	34369	$552.50				
	1/13/2023	34370	$1,611.51				
	1/13/2023	34371	$677.50				
	1/13/2023	34372	$270.00				
				$14,639.70	2067		
BPM	1/24/2023	53731	$347.94				
				$347.94	2068		
Holt Repair & Mfg., Inc.	1/11/2023	13103	$24,081.60				
				$24,081.60	2069		
Animal Damage Control, Inc.	1/9/2023	123406	$1,200.00				
				$1,200.00	2070		
California Association of Mutual Water Companies	1/25/2023	2346	$100.00				
				$100.00	2071		
Holt Repair & Mfg., Inc.	1/25/2023	13114	$1,597.57				
				$1,597.57	2072		
NOTES:			**Warrant Total**	**$43,756.60**			
Fund Balance as of December 31, 2022		$450,856.82					
Less Submitted Warrants for Payment:		$43,756.60					
Total:		**$407,100.22**					
Bank of Stockton Balance as of 12/31/22		$31,238.30					
		$438,338.52					