Draft
Environmental Impact Report

Dutch Slough Tidal Marsh Restoration Project

SCH# 2006042009

November 2008

Prepared for the
California Department of Water Resources
and the California State Coastal Conservancy

DRAFT ENVIRONMENTAL IMPACT REPORT: DUTCH SLOUGH TIDAL MARSH RESTORATION PROJECT

November 2008

SCH # 2006042009

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EXECUTIVE SUMMARY

OVERVIEW OF THE PROJECT AND DRAFT EIR

This Draft Environmental Impact Report (Draft EIR) addresses the potential environmental impacts of the Dutch Slough Tidal Marsh Restoration Project (hereinafter called Dutch Slough Restoration Project) near Oakley in Eastern Contra Costa County (See Figures 2-1 and 2-2). The proposed project entails wetland and upland restoration and public access to the 1,166-acre Dutch Slough property owned by the California Department of Water Resources (DWR). The property is comprised of three parcels separated by narrow man-made sloughs. Currently each parcel is leased for agricultural uses and grazing.

Tidal marsh restoration is seen by most Delta planning efforts (Delta Vision, Bay Delta Conservation Plan, CALFED Ecosystem Restoration Plan) as a critical component of improving the Delta ecosystem, and the primary goal of the Dutch Slough Tidal Marsh Restoration Project is to provide ecosystem benefits, including habitat for sensitive aquatic species. The project will be designed and implemented to maximize opportunities to assess the development of those habitats and measure ecosystem responses so that future Delta restoration projects will be more successful.

Two neighboring projects proposed by other agencies that are related to the Dutch Slough Restoration Project are also evaluated in concept in this Draft EIR (hereinafter called Related Projects). The City of Oakley is proposing a Community Park and Public Access Conceptual Master Plan (hereinafter referred to as City Community Park Project) for 55 acres adjacent to the wetland restoration project and four miles of levee trails on the perimeter of the DWR lands (See Figures 2-15 through 2-17). The City Community Park will provide parking and trailheads for the public access components of the Dutch Slough Restoration Project. The Ironhouse Sanitary District (ISD) is proposing the West Marsh Creek Delta Restoration Project (hereinafter called the Ironhouse Project), a restoration of a portion of the Marsh Creek delta on an adjacent 100-acre parcel to the west of Marsh Creek, owned by the ISD (See Figure 2-14). The Ironhouse Project could provide fill material for, and be linked to, the Dutch Slough Restoration lands.

This Draft EIR considers some of the environmental effects of the two Related Projects along with the effects of the Dutch Slough Restoration Project and its alternatives, and identifies overlapping and cumulative effects of the three projects. Although this Draft EIR provides some environmental analyses of the City Community Park and Ironhouse Project, subsequent California Environmental Quality Act (CEQA) review may be required for the Related Projects by their respective lead agencies (City of Oakley and ISD).

The proposed Dutch Slough Restoration Project is being planned by the Dutch Slough Management Team, which includes representatives from DWR, the California State Coastal Conservancy (SCC), the City of Oakley, and the California Bay-Delta Authority (CBDA). DWR is the landowner, having purchased the site in 2003 with funds from CBDA and the SCC, and is the CEQA lead agency for the restoration project. The SCC is assisting in the restoration planning with the Natural Heritage Institute (NHI). The City of Oakley is the lead agency for the City Community Park Project. The Ironhouse Sanitary District (ISD), along with NHI, is planning the restoration of the ISD parcel. The ISD is the CEQA lead agency for the Ironhouse Project.

PROJECT PURPOSE AND NEED

The Dutch Slough Restoration Project

The proposed Dutch Slough Restoration Project provides a significant opportunity to improve understanding of restoration science in tidal marsh wetland ecosystems in the region. It also would provide restored habitat for native fishes and other aquatic and wetland species.

The Dutch Slough Restoration Project has the following overarching goals:

1. Benefit native species by re-establishing natural ecological processes and habitats;
2. Contribute to scientific understanding of ecological restoration by implementing the project under an adaptive management framework; and,
3. Provide shoreline access, educational, and recreational opportunities.

Formulation of the Dutch Slough Restoration Project alternatives was driven primarily by goals 1 and 2. The public access and recreation features of the Dutch Slough Restoration Project (goal 3) were developed in a separate master planning process, led by the City of Oakley, and are generally compatible with all the restoration alternatives.

In response to goals 1 and 2, the Dutch Slough Restoration Project alternatives were developed to provide both ecosystem restoration and adaptive management benefits. Each restoration alternative includes habitat restoration features and adaptive management experiments. The experimental and restoration features are not mutually exclusive. Many of the experimental features are expected to provide significant restoration benefits, and restoration features provide opportunities for experimentation.

Related Projects

City of Oakley Community Park Project

The City of Oakley's proposed Community Park and Public Access Conceptual Master Plan is intended to provide shoreline access and educational and recreational opportunities for the community. Only the first phase of this Plan is evaluated in detail in this document. The City has the following goals for Plan implementation:

1. Provide and expand public access that is safe and consistent with the ecological and research goals of the project.
2. Create educational opportunities compatible with wildlife, habitat, and research goals.
3. Create recreational opportunities compatible with wildlife, habitat, and research goals.

Ironhouse Project

The Ironhouse Project would be located on 100 acres of irrigated pasture owned by the Ironhouse Sanitary District and approximately 10 acres of flood control channel owned by the Contra Costa County Flood Control District.

The Ironhouse Project goals (developed by the Natural Heritage Institute) are to:

1. Create a large restoration area to improve research opportunities, improve water quality, and increase habitat diversity;
2. Restore riparian vegetation and natural fluvial processes and forms along the Marsh Creek flood control channel (10 acres along 0.9 mile of channel);
3. Restore a large area of higher elevation tidal marsh (mean tide level, MTL) west of Marsh Creek that is comparable to tidal marsh treatments on the Dutch Slough property;
4. Provide up to 500,000 – 600,000 cubic yards of borrow material for creation of tidal marsh on subsided portions of the Dutch Slough property; and
5. Maintain the potential to restore a complex delta system at the mouth of Marsh Creek.

DUTCH SLOUGH RESTORATION PROJECT ALTERNATIVES

This Draft EIR analyzes a range of restoration alternatives to meet the habitat restoration, research and recreation goals of the Dutch Slough Restoration Project, with consideration of economic feasibility and public safety. The restoration alternatives were developed to provide both sustainable ecosystem restoration benefits and adaptive management experiments. These alternatives apply only to the Dutch Slough Restoration Project and not the Related Projects.

The alternatives are:

- Alternative 1: Low marsh and open water emphasis with minimal grading (Minimum Fill Alternative)
- Alternative 2: Mix of mid marsh, low marsh, and open water with moderate fill (Moderate Fill Alternative)
- Alternative 3: Mid marsh and low marsh emphasis with imported fill (Maximum Fill Alternative)
- Alternative 4: No Project: This alternative addresses leaving the site in current uses, consistent with existing City of Oakley (Open Space) general plan and zoning designations.

Some of the Alternatives include implementation options, which are also addressed in this document. In Alternatives 2 and 3, Marsh Creek may (or may not) be diverted onto the project site (or Ironhouse Project site) to restore a natural delta at the mouth of the creek. In addition, under Alternatives 1, 2, and 3, several management options are considered for the proposed open water areas. Also considered is the option to retain the Burroughs parcel as upland habitat (the "No Burroughs" option). The three restoration alternatives are consistent with providing high quality public access and restoration opportunities, and provide for protection of existing infrastructure.

This Draft EIR identifies the potential impacts and mitigation measures for each of the Dutch Slough Restoration Project alternatives and options, along with some of the potential impacts of implementing the Related Projects (City's Community Park, and Ironhouse Project).

The project is designed to adapt to anticipated Global Climate Change, including sea level rise, and to mitigate for its own greenhouse gas emissions. Issues related to Global Climate Change are discussed in detail in a number of sections of this Draft EIR.

PURPOSE AND USE OF THIS DRAFT EIR

The Draft EIR was prepared in compliance with CEQA and the CEQA Guidelines, as amended. Because the document may be adapted, augmented, or otherwise used by the US Army Corps of Engineers, Natural Resources Conservation Service, US Fish and Wildlife Service, or other federal agencies, in support of their documentation in compliance with the National Environmental Policy Act (NEPA), it addresses alternatives at an equal level, as required under NEPA. This document does not, however, include NEPA-mandated environmental justice and socioeconomic analyses. DWR, as the lead agency under CEQA, has the responsibility for the scope, content, and legal adequacy of the document.

This document is a project-level Draft EIR for the Dutch Slough Restoration Project and, in addition, assesses the potential impacts of the City's Community Park and the Ironhouse Project at a conceptual level.

DWR will use this document to evaluate the Dutch Slough Restoration Project for approval. The City of Oakley may use it in the approval of the first phase of the City's Community Park project. In addition, the ISD may use this Draft EIR in the approval process of the Ironhouse Project. These two Related Projects may require additional project-level CEQA analysis, to be conducted by their respective lead agencies upon development of more detailed implementation plans.

PUBLIC INVOLVEMENT PROCESS

The Dutch Slough Restoration Committee held four public meetings beginning in 2003 and through 2006 to solicit input from concerned agencies, individuals, and interested partners, and provide/exchange information with these various parties in the development of the restoration plan. Similarly, during the fall and summer of 2005, the City of Oakley held a series of workshops and meetings to solicit public input on the park design. The Dutch Slough Management Team held a CEQA Scoping Meeting on April 5, 2006 to solicit input on the Draft EIR scope of work. That meeting was preceded by distribution of a CEQA Notice of Preparation (of the Draft EIR) on March 24, 2006.

ENVIRONMENTAL IMPACTS, AND MITIGATION MEASURES

The environmental impacts of the Dutch Slough Restoration Project alternatives are summarized on Table S-1 and are briefly described by topic below. Impacts that apply only to the Related Projects are addressed in the Draft EIR text but not shown in this summary table.

Hydrology and Geomorphology

Alternatives 1, 2, and 3, as well as the Related Projects, would have potential impacts of erosion in terminal sloughs due to increased tidal prisms, possible decreased flood flow conveyance of Marsh Creek, possible changes in groundwater levels due to groundwater seepage, potential levee overtopping into the Contra Costa Canal, and sedimentation issues. Alternatives 1-3 also could result in possible groundwater seepage into the Canal. Most geomorphic and hydrologic impacts would be less than significant or would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. The project would be designed such that planned levees and deposition of plant materials and sediments would partially reduce/offset the effects of anticipated sea level rise, however this impact may still be significant.

Water Quality

Alternatives 1, 2, and 3, as well as the Related Projects, would have potential short-term impacts of degradation of water quality due to potential release of contaminants and sediment from construction activities, degradation of water quality due to increased mercury and dissolved organic carbon in Delta waters (as would Alternative 4), increased erosion and turbidity, possible increased salinity in the Contra Costa Canal (if not encased), and possible degradation of water quality from other pollutant sources associated with fill materials and Marsh Creek flows. Water quality impacts would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. In addition, Alternatives 1, 2 and 3 would have long-term beneficial effects on water quality both within the project area and the surrounding water bodies.

Geology and Soils

Alternatives 1, 2, and 3, as well as the Related Projects, would have potential impacts of exposing people or structures to potential substantial adverse effects (including liquefaction and levee failure) resulting from strong seismic ground shaking, erosion of soil, seepage-induced levee failure, and, on the park parcel, construction hazards associated with expansive soils. Alternative 4 would continue to subject existing structures to seismic hazards, as well as potential levee failure from seepage or overtopping. All short-term geological and soils impacts would be less than significant or would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. In addition, through construction or reconstruction of levees surrounding the site to increase their resistance to seismic shaking and liquefaction, Alternatives 1, 2, and 3 would provide additional flood control benefits to the surrounding lands.

Biological Resources: Terrestrial and Wetlands

While the implementation of Alternatives 1, 2, and 3, as well as the Related Projects, would provide significant habitat benefits by creating tidal marsh and other habitats, they would also have potentially significant impacts to wildlife by disturbing or eliminating existing freshwater marsh and seasonal wetland habitats, plus terrestrial habitats including riparian woodland/scrub, alkali meadow, as well as short-term impacts to a number of individual sensitive species. Impacts to biological resources with the exception of the potential for significant unavoidable impacts to burrowing owls, would be less than significant or would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR, as summarized in Table S-1, below. If the "no Burroughs" option were exercised, and the Burroughs parcel was not restored to tidal action,

impacts to terrestrial and wetland habitats and their associated species would be decreased. Alternative 4 would eliminate the habitat loss associated with project construction, but as described in the Comparison of Alternatives below "no action" would eliminate the project's anticipated significant long-term benefits to fish and wildlife.

Biological Resources: Aquatic Resources

Alternatives 1, 2, and 3 would have long-term beneficial effects on aquatic resources both within the project site and in surrounding waters. However, Alternatives 1, 2, and 3, as well as the Ironhouse Project, could have impacts to fish resulting from decreased water quality, creation of habitat for non-native fishes, entrainment of fish, and levee repair activities. Alternative 4 also would have possible impacts to fish associated with entrainment and levee repair. Most project impacts would be less than significant or would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. There may be significant unavoidable impacts to aquatic resources related to the potential introduction of non-native fish, summarized in Table S-1, below.

Air Quality

Alternatives 1, 2, and 3, as well as the Related Projects, would have potential short-term impacts from construction emissions, which would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. Vehicular emissions of all alternatives would be less than significant. Alternative 4 would have no air quality impacts. In the long-term, the project would reduce dust emissions associated with agricultural uses of the site. Alternatives 1, 2, and 3, would emit greenhouse gases during construction, however, in the long term, the project is expected to sequester carbon, resulting in a net reduction in greenhouse gases from the site. Alternative 4 would not change greenhouse gas emissions from the site.

Noise

Alternatives 1, 2, and 3, as well as the Related Projects, would have potential short-term construction noise impacts that would be less than significant. In addition, potentially significant noise impacts from the proposed park and associated ball fields would occur, but this would be mitigable (mitigation would be developed in subsequent City CEQA analysis of the park). Alternative 4 would have no noise impacts.

Aesthetics

Alternatives 1, 2, and 3, as well as the Ironhouse Project, would not affect light and glare. The City's Community Park could adversely affect light and glare; these impacts would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. Other aesthetic issues would be less than significant or cause no impact. Alternative 4 would have no aesthetic impacts.

Land Use

Alternatives 1, 2, and 3, as well as the Related Projects, are not expected to conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project. Alternatives 1, 2 and 3 would not affect other land use issues, such as physically dividing an established community. Because the existing zoning is Open Space, Alternative 4 would not result in any near-term development of the site. However, if the site were not used for restoration/park purposes, it could eventually be subject to development pressures.

Agricultural Resources

Alternatives 1, 2, and 3, as well as the Related Projects, would not conflict with a Williamson Act (agricultural land preservation) contract. There would be a less-than significant conversion related to agricultural resources, based on compliance with agricultural policies contained in the City of Oakley General Plan. Alternative 4 would not result in the conversion of any agricultural lands, however, in the long term it is possible that the site would be subject to development pressures or inundation.

Recreation

Alternatives 1, 2, and 3, as well as the Related Projects, would have the potential to impact long-term changes in recreational opportunities and could generate conflicts between non-motorized watercraft and motorized watercraft. Recreational impacts would be less than significant or would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. Alternative 4 would not result in any possible recreation impacts, but would not provide the recreation benefits that would be afforded by the proposed access plan and city park.

Cultural Resources

Alternative 1, 2, and 3, together with the City Community Park Project, would result in significant unavoidable impacts related to loss of historic buildings and landscapes, as summarized in Table S-1, below. Alternatives 1, 2, and 3 also could impact unknown archaeological resources, which would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. Alternative 4 would not result in any direct impact to historic resources, however historic structures on the site may continue to deteriorate.

Transportation/Traffic

Alternatives 1, 2, and 3, as well as the Related Projects, would have the potential to generate construction-related, operational traffic, and other traffic issues, which would be less than significant. Alternative 4 would not result in any traffic generation or parking impacts.

Public Services, Utilities, and Service Systems

For Alternatives 1, 2, and 3, as well as the Related Projects, the potential impact to police protection, fire protection, water supply, wastewater, storm drainage, and electrical and gas transmission would

be less than significant or mitigated to less than significant. Alternative 4 would not have any impacts to services or utilities.

Hazards and Hazardous Materials

For Alternatives 1, 2, and 3, as well as the Related Projects, the potential effects of soils contamination and building demolition would be mitigated to less than significant levels by implementation of mitigation measures identified in this Draft EIR. Alternative 4 would not result in any new hazardous materials on the site, nor would it eliminate any existing, hazardous materials.

Cumulative Impacts

The Dutch Slough Restoration Project, Related Projects, and other proposed or approved projects in the area, could result in short- or long-term cumulative impacts to hydrology and geomorphology, water quality, geology and soils, air quality, noise, aesthetics, land use, recreation, transportation/traffic, public services, utilities and service systems, and hazardous materials. However, all of these cumulative impacts would be less than significant or less than significant after mitigation.

The Dutch Slough Restoration Project, Related Projects, and other proposed or approved projects in the area would contribute to significant cumulative impacts on terrestrial and wetland biological resources, and on the Dutch Slough Rural Historic Landscape. Mitigation would reduce the project's contribution to these impacts, however they would still be significant. The projects also would result in cumulative benefits associated with provision of habitat for aquatic resources as well as recreation.

SIGNIFICANT UNAVOIDABLE IMPACTS

Significant unavoidable impacts under Alternatives 1, 2, or 3 include:

- Impacts to burrowing owls if they are present in the project area
- Creation of habitat that benefits non-native fish species
- Demolition of historic buildings/landscape features

COMPARISON OF ALTERNATIVES

CEQA Guidelines (Section 15126.6(a) and (e)(2)) require that a Draft EIR's analysis of alternatives identify the "environmentally superior alternative" among all of those considered. In addition, if the No Project Alternative is identified as environmentally superior, then the Draft EIR also must identify the environmentally superior alternative among the other alternatives. The primary adverse impacts of the Project are related to loss of agricultural lands, loss of historic landscapes, and degradation of hydrologic, water quality and biological resources. However, the Project also would provide substantial wetland/aquatic habitat and public access opportunities that would not be provided by Alternative 4 (No Project). Alternative 4 also would not provide enhanced flood protection nor would it protect the site from impacts of possible future development. Because

Alternative 4 would eliminate some of the potential adverse impacts associated with project development, it is considered the Environmentally Superior Alternative.

As required by CEQA, the other project alternatives were analyzed to determine which would be the Environmentally Superior Alternative. Alternative 1 could have somewhat less environmental impacts than Alternatives 2 and 3. Therefore this EIR considers the CEQA Environmentally Superior Alternative to be Alternative 1. It should be noted, however, that even this alternative and despite mitigation, would result in some significant adverse impacts, as with Alternatives 2 and 3. In addition, Alternative 1 would result in fewer long-term benefits of providing restored wetland habitat than Alternatives 2 or 3, and would not fully satisfy the restoration project's objectives.

Table S-1 Comparison of Impacts of Dutch Slough Restoration Project Alternatives

Impact Number	Impact	Alternative 1: Minimum Fill	Alternative 2: Moderate Fill/Preferred Alternative	Alternative 3: Maximum Fill Alternative	Alternative 4: No Project
Hydrology and Geomorphology					
3.1.1-1/2-1/3-1/4-1	Erosion in terminal sloughs due to increased tidal prisms	◑	◑	◑	○
3.1.1-5/2-7/3-7/4-2	Possible water quality degradation in Contra Costa Canal due to groundwater seepage	◑	◑	◑	○
3.1.1-6/2-8/3-8	Groundwater intrusion onto adjacent parcels	◑	◑	◑	○
3.1.1-7/2-9/3-9	Wind-wave driven levee overtopping of southern uplands into Contra Costa Canal	◑	◑	◑	○
3.1.1-8/2-10/3-10	Insufficient sedimentation in new wetland basin to keep up with Sea-level rise	?	?	?	○
3.1.1-9/2-11/3-11	Limited persistence of shallow tidal marsh channels	◑	◑	◑	○

KEY:

● = Significant and not mitigable impact ◑ = Significant and mitigable impact ⊖ = Less than significant impact ○ = No impact + = Beneficial impact

? = unknown/speculative

Note: Impact levels are the same for all Alternatives unless otherwise noted.

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Impact Number	**Impact**	**Alternative 1:** Minimum Fill	**Alternative 2:** Moderate Fill/Preferred Alternative	**Alternative 3:** Maximum Fill Alternative	**Alternative 4:** No Project
3.1.2-3/3-3	Point bar formation in Marsh Creek	○	◑	◑	○
3.1.2-4/3-4	Sedimentation in tidal portion of relocated Marsh Creek channel	○	◑	◑	○
3.1.5-1	Cumulative Impact - Groundwater seepage into the C. C. Canal	○	○	○	○
3.1.5-2	Cumulative Impact – Groundwater seepage into Cypress Grove and Dutch Slough properties	○	○	○	○
3.1.5-3	Cumulative Impact – Groundwater seepage and tidal flooding east into Hotchkiss Tract	◐	◐	◐	○
3.1.5-4	Cumulative Impact – Tidal flooding south into Cypress Grove and Dutch Slough properties	◑	◑	◑	○
3.1.5-5	Cumulative Impact – Excess Scour in Emerson Slough	◐	◐	◐	○

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Impact Number	Impact	**Alternative 1:** Minimum Fill	**Alternative 2:** Moderate Fill/Preferred Alternative	**Alternative 3:** Maximum Fill Alternative	**Alternative 4:** No Project
3.1.5-6	Cumulative Impact – Excess scour in Little Dutch Slough	◐	◐	◐	○
Water Quality					
3.2.1-1/2-1/3-1/4-1	Degradation of water quality due to release of contaminants and sediment from construction activities	◑	◑	◑	◐
3.2.1-2/2-2/3-2	Degradation of water quality due to increased dissolved organic carbon (DOC) in Delta waters	◑	◑	◑	◑
3.2.1-3/2-3/3-3	Degradation of water quality due to increased erosion and turbidity after construction	◑	◑	◑	○
3.2.1-4/2-4/3-4	Degradation of water quality due to increased mercury methylation	◑	◑	◑	○

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Impact Number	Impact	Alternative 1: Minimum Fill	Alternative 2: Moderate Fill/Preferred Alternative	Alternative 3: Maximum Fill Alternative	Alternative 4: No Project
3.2.1-5/2-5/3-5	Degradation of drinking water quality due to alteration of salinity levels in Delta waters	◐	◐	◐	○
3.2.1-6/2-6/3-6	Degradation of water quality due to increased salinity concentrations in the Contra Costa Canal	◑	◑	◑	○
3.2.1-7/2-7/3-7	Degradation of water quality due to elevated metals, endocrine disrupting chemicals, or other pollutants	◑	◑	◑	○
3.2.1-8/2-8/3-8	Cumulative Impacts	◑	◑	◑	○
Geology and Soils					
3.3.1-1/2-1/3-1/4-1	Expose people or structures to potential substantial adverse effects (including levee failure) resulting from a surface rupture of a known earthquake fault	○	○	○	○

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3.3.1-2/2-2/3-2/4-2	Expose people or structures to potential substantial adverse effects (including levee failure) resulting from strong seismic ground shaking	◑	◑	◑	◐
3.3.1-3/2-3/3-3/4-3	Expose people or structures to potential substantial adverse effects (including levee failure) resulting from ground failure, including liquefaction	◑	◑	◑	◑
3.3.1-4/2-4/3-4/4-4	Expose people or structures to potential substantial adverse effects resulting from landslides	○	○	○	○
3.3.1-5/2-5/3-5/4-5	Substantial soil erosion or loss of topsoil	◑	◑	◑	◐
3.3.1-6/2-6/3-6/4-6	Landslide, lateral spreading, subsidence, liquefaction, or collapse resulting from construction on an unstable geological unit or unstable soils	◑	◑	◑	◑
3.3.1-7/2-7/3-7/4-7	Risk to life or property resulting from construction of structures on expansive soils	◑	◑	◑	◑
3.3.1-8/2-8/3-8/4-8	Levee failure resulting from erosion	◑	◑	◑	◑

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3.3.1-9/2-9/3-9/4-9	Levee failure resulting from seepage	◑	◑	◑	◑
Biological Resources: Terrestrial and Wetlands					
3.4.1-1.1/2-1.1/3-1.1	Potential impacts to wildlife in irrigated pasture and ruderal terrestrial habitats	◑	◑	◑	○
3.4.1-1.2/2-1.2/3-1.2	Potential wildlife disturbance (direct and indirect) on terrestrial habitats associated with recreation	◑	◑	◑	○
3.4.1-2.1/2-2.1/3-2.1	Potential impacts of dredging Little Dutch and Emerson sloughs	◑	◑	◑	○
3.4.1-2.2/2-2.2/3-2.2	Potential wildlife disturbance (direct and indirect) around the marsh edge associated with recreation	◑	◑	◑	○
3.4.1-2.3/2-2.3/3-2.3	Potential wildlife disturbance (direct and indirect) associated with maintenance of exterior levee	◑	◑	◑	○
3.4.1-3/2-3/3-3	Potential impacts to nontidal freshwater marsh and riparian woodland/scrub and associated wildlife species	◑	◑	◑	○
3.4.1-4/2-4/3-4	Potential impacts to alkali meadow and seasonal wetland flats and	◑	◑	◑	○

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	associated wildlife species				
3.4.1-5.1/2-5.1/3-5.1	Potential impacts to special-status plants	◑	◑	◑	○
3.4.1-5.2/2-5.2/3-5.2	Impacts to special-status tidal marsh plants of dredging Little Dutch and Emerson sloughs	◑	◑	◑	○
3.4.1-6/2-6/3-6	Potential loss of roosting sites for special-status bat species	◑	◑	◑	○
3.4.1-7/2-7/3-7	Potential impacts to Cooper's hawk	◑	◑	◑	○
3.4.1-8/2-8/3-8	Potential loss of Swainson's hawk foraging and nesting habitat	◑	◑	◑	○
3.4.1-9/2-9/3-9	Potential Impacts to burrowing owls	● (if present onsite)	● (if present onsite)	● (if present onsite)	○
3.4.1-10/2-10/3-10	Potential Impacts to white-tailed kite and northern harrier	◑	◑	◑	○
3.4.1-11/2-11/3-11	Potential impacts to nesting birds	◑	◑	◑	○

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3.4.1-12/2-12/3-12	Potential impacts to tricolored blackbirds	◑	◑	◑	○
3.4.1-13/2-13/3-13	Potential impacts to California horned larks	◑	◑	◑	○
3.4.1-14/2-14/3-14	Potential impacts to loggerhead shrikes	◑	◑	◑	○
3.4.1-15/2-15/3-15	Potential impacts to yellow-breasted chats and other marsh and riparian songbirds	◑	◑	◑	○
3.4.1-16/2-16/3-16	Potential impacts to special-status wading birds	◑	◑	◑	○
3.4.1-17/2-17/3-17	Potential impacts to California black rails	◑	◑	◑	○
3.4.1-18/2-18/3-18	Potential impacts to California tiger salamanders	◑	◑	◑	○
3.4.1-19/2-19/3-19	Potential impacts to California Red-legged frogs	◑	◑	◑	○
3.4.1-20/2-20/3-20	Potential impacts to northwestern pond turtles	◑	◑	◑	○
3.4.1-21/2-21/3-21	Potential impacts to giant garter snakes	◑	◑	◑	○
3.4.1-22/2-22/3-22	Potential impacts to silvery legless lizards	◑	◑	◑	○

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Table S-1 Comparison of Impacts of Dutch Slough Restoration Project Alternatives

3.4.1-23/2-23/3-23	Potential impacts to vernal pool fairy shrimp and other special status vernal pool invertebrates	◑	◑	◑	○
3.4.1-24/2-24/3-24	Potential impacts to valley elderberry longhorn beetles	◑	◑	◑	○
3.4.1-25/2-25/3-25	Potential impacts to Heritage or other trees protected by local ordinance	◑	◑	◑	○
Biological Resources: Aquatic Resources					
3.5.1-1/2-1/3-1	Decreased water quality due to construction/dredging activities	◑	◑	◑	○
3.5.1-2/2-2/3-2	Release of low quality water from project area during pre-breach water management periods	◑	◑	◑	○
3.5.1-3/2-3/3-3/4-2	Entrainment of fish into areas disconnected from the Bay-Delta	◑	◑	◑	◑
3.5.1-4/2-4/3-4	Potential mercury methylation could cause bioaccumulation and toxicity to fish	◑	◑	◑	○
3.5.1-5/2-5/3-5	Disturbance of benthic habitats	◐	◐	◐	○

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3.5.1-6/2-6/3-6	Creation of habitat that benefits non-native fish species	●	●	●	○
3.5.1-7/2-7/3-7	Endocrine disrupting chemicals and other contaminants entering the site from Marsh Creek or from fill soils could harm fish	◑	◑	◑	○
3.5.1-8/2-8/3-8	Cumulative Impacts	◑	◑	◑	○
3.5.4-1	Reduced water quality due to levee repair activities	○	○	○	◑
3.5.4-2	Entrainment of fish inside the project site through unintended levee breaches or overtopping	○	○	○	◑
Air Quality					
3.6.1-1/2-1/3-1	Vehicular emissions	◐	◐	◐	○
3.6.1-2/2-2/3-2	Construction emissions	◑	◑	◑	○
3.6.1-3/2-3/3-3	Greenhouse gasses	◐	◐	◐	○

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Noise					
3.7.1-1/2-1/3-1	Construction noise impacts	◐	◐	◑	○
Aesthetics					
3.8.1-1/2-1/3-1/4-1	Effect on a scenic vista	○	○	○	○
3.8.1-2/2-2/3-2/4-2	Effect on a scenic resource	○	○	○	○
3.8.1-3/2-3/3-3/4-3	Effect on visual quality of the site and its surroundings	◐	◐	◐	○
Land Use					
3.9.1-1/2-1/3-1	Physically divide an established community	○	○	○	○
3.9.1-2/2-2/3-2	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.	○	○	○	○
3.9.1-3/2-3/3-3	Conflict with any applicable habitat conservation plan or natural community conservation plan	○	○	○	○

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Agricultural Resources					
3.10.1-1/2-1/3-1	Conversion of Prime/Unique Farmland or Farmland of Statewide Importance	◍	◍	◍	○
3.10.1-2/2-2/3-2	Conflict a Williamson Act contract	○	○	○	○
3.10.1.3/2.3/3.3	Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of farmland to non-agricultural use	○	○	○	○
Recreation					
3.11.1-1/2-1/3-1	Conflicts between non-motorized watercraft and motorized watercraft	◑	◑	◑	○
3.11.1-2/2-2/3-2	Temporary effects on recreational access during project construction	◍	◍	◍	○
3.11.1-3/2-3/3-3	Long-term changes in recreational opportunities	+	+	+	○

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Cultural Resources					
3.12.1-1/2-1/3-1	Loss of unknown archaeological resources	◑	◑	◑	○
3.12.1-2/2-2/3-2	Cumulative effect of demolition of historic buildings and landscape features	●	●	●	◐
Transportation/Traffic					
3.13.1-1/2-1/3-1	Trip distribution and roadway capacity	◐	◐	◐	○
3.13.1-2/2-2/3-2	Parking	◐	◐	◐	○
3.13.1-3/2-3/3-3	Cumulative traffic considerations	◐	◐	◐	○
Public Services, Utilities and Service Systems					
3.14.1-1/2-1/3-1	Effect on police protection	◐	◐	◐	○
3.14.1-2/2-2/3-2	Effect on fire protection	◐	◐	◐	○
3.14.1-3/2-3/3-3	Effect on water supply	◐	◐	◐	○

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3.8.1-4/2-4/3-4	Effect on wastewater	◐	◐	◐	○
3.14.1-5/2-5/3-5	Effect on storm drainage	◐	◐	◐	○
3.14.1-6/2-6/3-6	Effect on electrical and gas transmission	◐	◐	◐	○
Hazards and Hazardous Materials					
3.15.1-1/2-1/3-1	Effects of Dutch Slough parcel soils contamination	◑	◑	◑	○
3.15.1-2/2-2/3-2/4-2	Health risks associated with demolition activities	◑	◑	◑	○
3.15.1-3/2-3/3-3/4-3	Health effects to workers from use of soils from Ironhouse parcel	◐	◐	◐	○
3.15.1-4/2-4/3-4/4-4	Health effects from mosquitoes	◑	◑	◑	○
3.15.4-1	Effects of existing contaminated soils	○	○	○	◐

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