

**DRAFT FONSI
AND
DRAFT ENVIRONMENTAL
ASSESSMENT/INITIAL STUDY**

for the

**PROPOSED
BLACKLOCK RESTORATION PROJECT**

Suisun Marsh, Solano County, California
SRCD Ownership #635

Prepared By
Division of Environmental Services
California Department of Water Resources
and
U.S Bureau of Reclamation
Mid-Pacific Region
Sacramento, CA

July 2006

DRAFT FINDING OF NO SIGNIFICANT IMPACT

BLACKLOCK RESTORATION PROJECT

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Sacramento, California

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BLACKLOCK RESTORATION PROJECT SUISUN MARSH, SOLANO COUNTY, CALIFORNIA

The Bureau of Reclamation proposes to contribute funds to the Department of Water Resources toward the restoration of the 70-acre Blacklock site to a fully functioning tidal wetland by constructing levee breaches in two locations. Once the levee is breached, the approach would be to use a passive strategy in which natural sedimentation and plant detritus accumulation contributes to restore intertidal elevations, and natural colonization establishes the desired plant and wildlife communities. The underlying restoration requirement for this site is subsidence reversal, as the site ranges from 3 to more than 5 feet below local mean high water. Tidal flow is expected to utilize the existing remnant channels to some extent, with some new channels forming as sedimentation progresses. This design is a minimal-engineering approach that relies on natural processes to meet project goals and objectives of improving habitat conditions for tidal marsh species.

The Mid-Pacific Region of Reclamation has found that the proposed action is not a major Federal action that would significantly affect the quality of the human environment. Therefore, an environmental impact statement is not required for carrying out the proposed action. This finding of no significant impact is based on the following:

1. The analysis in the EA indicates that adverse effects to upland biological communities and wildlife habitats would be minimal because the site is currently flooded and the amount and the quality of upland habitats are limited to disturbed levee areas.
2. There would be no net loss of wetlands, as restoring tidal flows would eventually allow for the establishment of tidal marsh habitats and subsequent benefits to native tidal marsh species.
3. The analysis in the EA indicates that significant adverse effects to listed endangered or threatened species and their habitats would be avoided. Restoring tidal flows would eventually allow for the establishment of tidal marsh habitats and subsequent benefits to listed tidal marsh species. Reclamation is informally consulting with the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) to ensure that the proposed tidal marsh restoration actions would not adversely affect listed species or critical habitats. A letter concurring that the proposed action would not likely adversely affect listed species or critical habitats was sent by the FWS on July 14, 2006, and a concurrence letter is expected from the NMFS.
4. Short-term adverse water quality effects would occur when pond water is initially mixed with tidal water after the levees are breached. The water quality effects would not be significant because they would be limited to one tidal cycle, and water volume of water in the pond is much less than the volume of water in Little Honker Bay and Nurse Slough which would quickly dilute water flowing from the pond.
5. Short-term adverse air quality effects would occur from dust generation and diesel fuel exhaust during the breach construction. The air quality effects would not be significant because they will be limited to 2-4 days, 6 hours per day.
6. Based on the analysis in the environmental assessment, cultural resources would not be adversely affected by the proposed action. Field surveys and literature searches did not identify cultural resources on the site.

7. The environmental assessment indicates that there are no Indian Trust Assets on the Blacklock restoration site; therefore, the proposed action would not adversely affect any Indian Trust Assets.
8. Implementing the proposed action would not disproportionately affect minorities or low-income populations and communities because adverse environmental or health effects are not expected.
9. The proposed action would not significantly affect recreation in Suisun Marsh. The site has historically been closed to public use. Hunting has not been authorized since DWR acquired the property in 2003 from a private landowner.
10. The analysis in the environmental assessment indicates that there would not be a significant effect on flooding. DWR has improved the cross levee to offset any potential increase in flooding private property from the restoration site.

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BLACKLOCK RESTORATION PROJECT

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- A Draft Restoration Plan for the Blacklock Restoration Project
- B FWS Species list (document # 060330024152)
- C CEQA Environmental Checklist

BLACKLOCK RESTORATION PROJECT

EA/IS

List of Acronyms

ADCP	Acoustic Doppler current profiler
BCDC	San Francisco Bay Conservation and Development Commission
BLL	Blacklock water quality monitoring station
BMPs	Best management practices
CBDA	California Bay Delta Authority
CCR	California clapper rail
CDEC	California Data Exchange Center
DEM:	Digital elevation model
DFG	California Department of Fish and Game
DWR	Department of Water Resources
EC	Electrical conductivity
ECAT	Environmental Coordination and Advisory Team
FWS	U.S. Fish and Wildlife Service
HDPE	High density polyethylene
MHHW	Mean higher high water
MLLW	Mean lower low water
MSL	Mean sea level
NAVD 88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NOS/COOPS	National Oceanographic and Atmospheric Administration's Ocean Service/Center for Operational Oceanographic Products and Services
OBS	Optical backscatter
PRBO	Point Reyes Bird Observatory
RWQCB	Regional Water Quality Control Board
SCMAD	Solano County Mosquito Abatement District
SET	Sediment erosion table
SMHM	Salt marsh harvest mouse
SMPA	Suisun Marsh Preservation Agreement
SRCD	Suisun Resource Conservation District
SSC	Suspended sediment concentration
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey

1.0 INTRODUCTION AND PURPOSE AND NEED

The Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation), in cooperation with the California Department of Fish and Game (DFG) and the Suisun Resource Conservation District (SRCD), have prepared this Environmental Assessment/Initial Study (EA/IS) for the Blacklock site (Figure 1). This EA/IS describes actions to restore 70 acres of diked, managed marsh to tidal wetlands, using a minimally engineered approach. Background and supporting documentation is presented in the Draft Restoration Plan (Appendix A). DWR released this Plan in April 2006. The Draft Restoration Plan was reviewed by the FWS, DFG, Reclamation and SRCD and underwent CALFED Science Program independent review. Comments received were incorporated in the revised version dated June 2006. The Draft Plan (June 2006) is also available on-line at http://www.iep.ca.gov/suisun/restoration/blacklock/doc/BlacklockDraftRestorationPlan_061506.pdf.

Reclamation is the NEPA lead for this action. The California Department of Water Resources (DWR) is the California Environmental Quality Act (CEQA) lead. Cooperating agencies include the California Department of Fish and Game (DFG), Suisun Resource Conservation District (SRCD) plus the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers in an advisory role.

1.1 Background

Suisun Marsh, about 35 miles northeast of San Francisco in southern Solano County (Figure 1), provides habitat for numerous species of plants, fish, and wildlife. Historically, the Suisun Bay and Marsh included about 68,000 acres of tidal wetlands. From the mid-1880s to the early 1900s, over 90 percent of these wetlands were reclaimed for agriculture. Agricultural production and success was limited due to increased salinity in the Suisun Bay/Marsh region. Today, most of the levees originally constructed for agricultural reclamation now form part of the infrastructure for managing water levels in seasonal nontidal (managed) wetlands (Goals Project, 1999).

In 1987 DWR, the California Department of Fish and Game (DFG), USBR and the Suisun Resource Conservation District (SRCD) signed the Suisun Marsh Preservation Agreement (SMPA) to mitigate for adverse impact on the marsh resulting from operation of the State Water Project, federal Central Valley Project, and a portion of upstream diversions. Planned actions included construction of large scale facilities and management actions to provide channel water salinity of adequate quality for waterfowl food –plant production. The SMPA agencies revised the SMPA and its companion Mitigation and Monitoring Agreements in 2005. The Revised SMPA identified that Phase C funds of the Suisun Marsh Mitigation Agreement, a companion agreement to the SMPA, would be used for multi-species management in the Suisun Marsh.

A grant proposal, *Suisun Marsh Property Acquisition and Habitat Restoration Project*, was prepared and submitted by DWR in 2000 with collaboration from the Suisun SMPA Environmental Coordination and Advisory Team (ECAT), which includes DWR, Reclamation, DFG, SRCD, and USFWS. DWR acquired the Blacklock property in December 2003 using CALFED Ecosystem Restoration Program grant funds and Suisun Marsh Mitigation Agreement Phase C Mitigation funds. The Suisun Marsh Mitigation Agreement funds were provided by the SMPA agencies to match CALFED grant funds. Since Suisun Marsh Mitigation Agreement Funding was identified as the source of cost-share funding for this effort, this became an ECAT project.

The grant proposal hypothesized that restoration of managed wetland habitat in Suisun Marsh to tidal wetland that includes low-marsh habitat, high-marsh habitat, and an upland transition zone would aid in the recovery of Suisun

Marsh special status and listed plant and animal species, and could improve water quality in the Sacramento-San Joaquin Delta.

Since acquisition, and through restoration planning, DWR has maintained the property as a managed wetland and followed an "interim management" strategy of moist soil management to encourage the growth and spread of emergent vegetation on the site and allow for circulation throughout the property.

The Blacklock parcel has been flooded since late December 2005. Weather and Delta outflows during winter 2006 resulted in higher than normal tides throughout Suisun Marsh, sometimes 1-2 feet above predicted levels. The flooding is due to overtopping of the levees at high tides and seepage through the levee in several locations.

The exterior levees of this parcel are in poor condition and continue to deteriorate. Areas of severe erosion have been documented since DWR acquired the parcel in December 2003 and have worsened over the years. Attempts to repair the most severe areas were attempted in 2004, but were unsuccessful. During winter 2005-06, two significant holes through the levee developed, at stations 14+00 (Arnold Slough side) and at 52+00 (Little Honker Bay Side) (Figure 2). In addition, there are several other locations where seepage occurs at higher tides. The parcel drains during low tide through the 30 inch culvert. Although the hole at 14+00 was repaired in April 2006, there is still more water flowing into the site than draining out, thus leaving the parcel in a flooded state. The existing condition of the levee, and high water levels in the adjacent sloughs may prevent the site from fully draining to its pre-flooded state prior to construction of breaches in the preferred locations.

Water level on the inside of the parcel is monitored as reservoir level of the BLL site on the California Data Exchange Center (CDEC) and is available at <http://cdec2.water.ca.gov/cgi-progs/queryFx?s=bll>. While water levels have fluctuated since the New Year, pickleweed and salt grass areas have remained flooded.

CEQA compliance for the acquisition of this property was completed when DWR filed a Notice of Exemption in May 2003. Reclamation prepared an Environmental Assessment and a FONSI in November 2003 to meet NEPA requirements. A detailed history of Suisun Marsh activities is described in the EA for acquisition, prepared by Reclamation in 2003.

Reclamation prepared an Environmental Analysis and FONSI for the Blacklock Restoration Site Water Quality and Meteorological Monitoring Station installation in July 2004. DWR filed a Notice of Exemption (information collection) in January 2004 for station installation to comply with CEQA.

1.2 Project Needs and Objectives

Purpose and Need

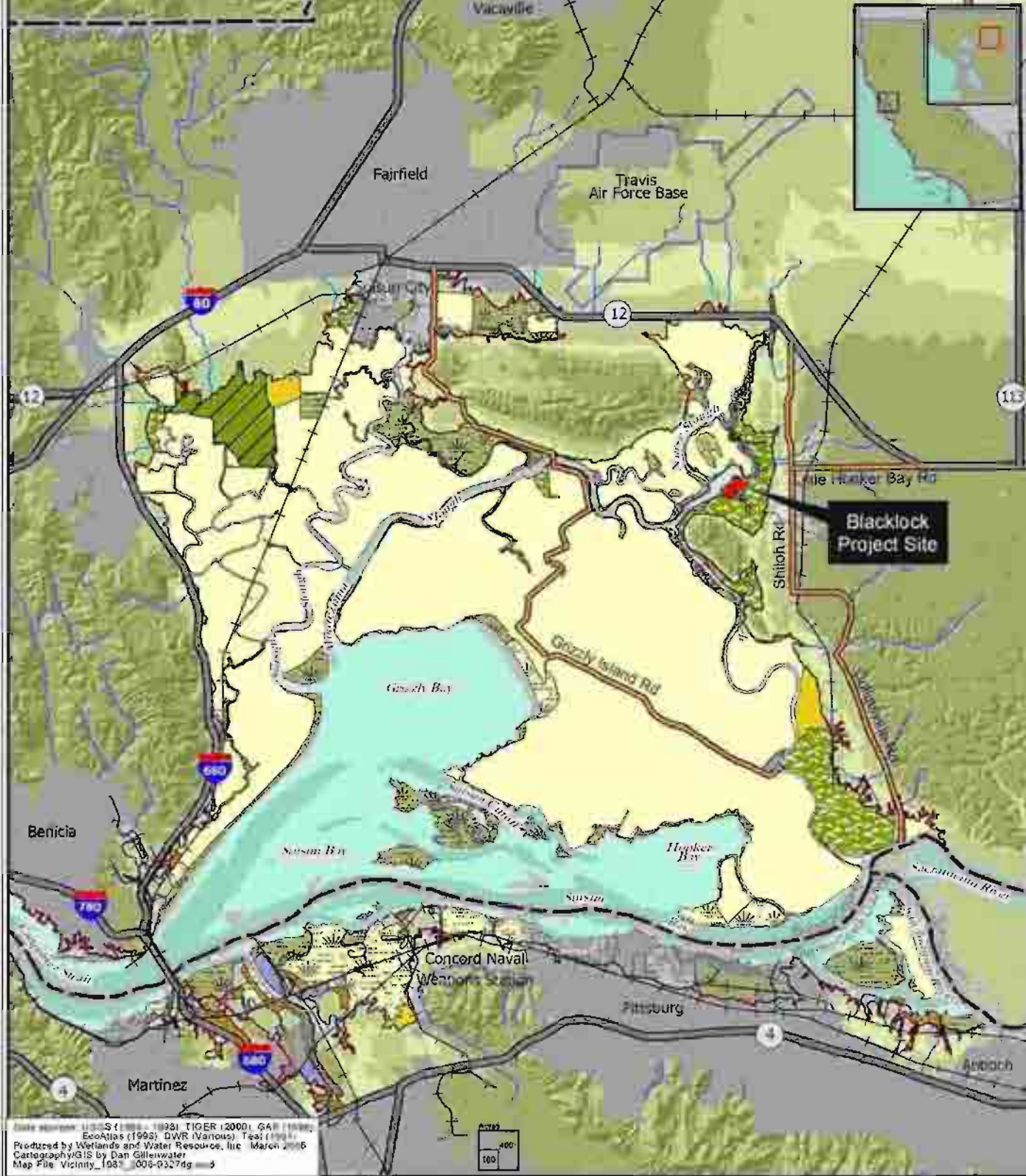
The purpose and need of this proposed federal action is to facilitate multi-species habitat needs addressed by the SMPA and CALFED ERPP, including efforts toward recovery of listed and special status Suisun Marsh species, through the restoration of the Blacklock site to a fully functioning, self-sustaining tidal wetland ecosystem that would provide high quality habitat for these listed and special status plants and animals, and acquire scientific knowledge to improve understanding of tidal marsh restoration processes, strategies, and ecological outcomes.

The goals and objectives guiding this project are as follows:

Goals: (1) To increase the area of tidal brackish emergent wetlands in Suisun Marsh to aid in the recovery of listed and sensitive species, and (2) acquire scientific knowledge that leads to improved understanding of tidal marsh restoration processes, strategies, and ecological outcomes within Suisun Marsh.

Restoration objectives: To restore the Blacklock property to a self-sustaining functioning brackish tidal marsh by restoring tidal action, reversing subsidence, and promoting establishment of native vegetation and a tidal marsh channel network appropriate to this location within the San Francisco Estuary.

Science objectives: To allow for and encourage collaborative science opportunities in the project design and monitoring phases that support regional adaptive resource management needs.



Data sources: USGS (1989, 1993), TIGER (2000), GAI (1998),
 EcoAtlas (1998), DWR (Various), Teal (1994),
 Produced by Wetlands and Water Resources, Inc. March 2006
 Cartography/GIS by Dan Gallewater
 Map File: Vicinity_1987_000-0327dg.mxd

Reference Features	Elevation (NGVD feet)	Bayland Habitat Types
Streets	~ 20	Managed Marsh
Highway	10 to 20	Diked Marsh
Railroad	5 to 10	Farmed Bayland
County Boundary	0 to 5	Grazed Bayland
River or Creek	-5 to 0	Ruderal
Historic Baylands Margin	Bay and Ocean	Storage or Treatment Basin
Urban Area	Deep Bay or Ocean	Tidal Marsh
	Shallow Bay	Muted Tidal Marsh
	Tidal Mudflat	

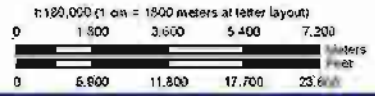


FIGURE 1: BLACKLOCK VICINITY
 Blacklock Restoration Project
 Solano County, California



2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Location

This property is identified as SRCD ownership number 635. It is located in the northeast Suisun Marsh bordering Little Honker Bay (Figure 1) on the north, and Arnold Slough on the west and south. The east side of the property is adjacent to Suisun Marsh ownership 604, a privately managed seasonal wetland. The property located on the Denverton USGS 7.5 minute topographic map at township 4 North, Range 1 East, Sections 19-20.

The parcel is approximately 70 acres, which includes about 67 acres seasonal wetland and 3 acres upland/levee. Existing site features include a diked, managed marsh, a partial remnant network of sloughs, an interior borrow ditch, and seasonally and perennially ponded areas (Figure 2). There is fringing tidal marsh on the outboard side of the exterior levees.

2.2 No Action

Under the No Action Alternative, levee breaches would not be constructed. The levees would continue to erode and a breach (or breaches) would likely occur in other locations along the exterior levee. Breaches in other locations would likely not have full tidal exchange initially. In addition, unintended levee breaches would not maximize sediment accretion (subsidence reversal) on the property. The property would continue with the exiting interim management until the levee breaches.

2.3 Proposed Action

The proposed action is to restore this property to a fully functioning tidal wetland by constructing levee breaches in two locations. Once the levee is breached, the approach would be to use a passive strategy in which natural sedimentation and plant detritus accumulation restores intertidal elevations, and natural colonization establishes the plant and wildlife communities. The underlying restoration requirement for this site is subsidence reversal, as the site ranges from 3 to more than 5 feet below local mean high water. The project includes an interim management element to promote vegetation cover at the site prior to breaching to enhance these natural restoration processes. Tidal flow is expected to utilize the existing remnant channels to some extent, with some new channels forming as sedimentation progresses. This design is a minimal-engineering approach that relies on natural processes to meet project goals and objectives. A detailed description of the design approach and hydrodynamic modeling conducted to determine the preferred locations is presented in Appendix A.

2.3.1 Anticipated Outcomes

Projected outcome scenarios are based on a variety of sources, use of computer models, and review of the literature and evaluation of other restorations within the San Francisco Estuary.

- The site would increase in elevation over time via natural sedimentation processes-mineral sediments moving in from Little Honker Bay and decomposition of vegetation on site.
- Full, unimpeded tidal exchange throughout the site.
- As elevations increase, vegetation will colonize throughout the site.

This restoration represents an opportunity to realize many of the ecosystem benefits that are commonly associated with healthy tidal marsh habitat. Fisheries benefits include providing habitat for delta smelt (*Hypomesus transpacificus*), longfin smelt (*Spirinchus thaleichthys*) Sacramento splittail (*Pogonichthys macrolepidotus*),

Chinook salmon (*Oncorhynchus tshawytscha*) and other aquatic species. Targeted wildlife species include Suisun song sparrow (*Melospiza melodia maxillaris*), black rail (*Laterallus jamaicensis*), common yellowthroat (*Geothlypis trichas*) and other avian species.

Restoration of tidal flows would produce substantial changes to the habitats and biological, physical, and chemical functions of the site. Immediately after breaching, the site is expected to be shallow open water with remnant emergent vegetation during much of the tidal cycle and exposed pond bottom and remnant vegetation during low tides.

A new tidal channel network is expected to form, partially re-occupying remnant channels and otherwise forming within the newly forming tidal marsh surface. Vegetation would transition to a mix of species suited to the intertidal brackish environment, with the site eventually becoming fully vegetated except for channels. Some open water areas may persist in the long term.

Knowledge expected to be gained from this restoration includes but is not limited to rates of sedimentation and marsh development, the role of existing emergent vegetation in influencing sedimentation, channel network formation and overall geomorphology, hydrology, water quality impacts, methyl mercury production, and species use. Results would inform scientists and decision makers in long-term land use and restoration planning throughout Suisun Marsh.

2.3.2 Preferred Approach: Constructed Levee Breaches

Modeling results indicate that the site drains better at low tide with two breaches on the property. Therefore, two locations, 55+00 and 25+00 are identified as preferred breach locations. Station 55+00, along Little Honker Bay (Figure 2) would allow for an unimpeded exchange of flows during tidal cycles. Because there is no in-channel island or fringing tidal marsh here, it is expected that a breach at this location would optimize the transport of available Little Honker Bay sediments into the property to raise surface elevation through sediment deposition. In addition, a breach at this location could take advantage of the remnant tidal slough network within the property. It is unlikely that an unintended levee failure would occur at this location. The levee is wider and higher than other areas and there is (remnant) riprap on the waterside slope and toe.

The second breach would be located along Arnold Slough, preferably at 25+00, which lines up with an existing channel and would serve the southwest corner well.

Modeling suggests that a breach size of at least 65 feet (20 meters) would be sufficient for full tidal exchange. A detailed description of hydrodynamic modeling conducted for this project is included in the Appendix A. The site would be monitored to assess whether constructing the breaches in these locations achieve project goals, objectives and desired outcomes. The site would be adaptively managed (as described in section 2.6) as necessary.

Unintended Levee Failure

Much of the exterior levee of this parcel is in poor condition. In addition to the hole near 52+00, several areas along the exterior levee are severely eroded (Figure 2). Erosion is most severe at 47+50 and from 36+00 to 38+00. Without additional maintenance to the levee near 52+00 and other severely eroded areas, DWR and SRCD staff as well as the project science advisor, Dr. Siegel, expect that a breach at one or more of these locations would occur within the next year, and possibly sooner.

In the event of an unintended levee failure at one of the expected or another location along the exterior levee, the site would be monitored to assess whether project goals, objectives and desired outcomes are being achieved. Specifically, monitoring would focus on the tidal regime inside the parcel, evolution of the breaches, tidal exchange through the breach, marsh development, sediment accretion and elevation changes within the subsided lands. Biological objectives would also be evaluated including what fish species are using the site and vegetation development.

The Project Manager, in conjunction with the established Advisory Team and Science Advisor would use this information to evaluate if the unplanned breach is sufficient for development of a functioning tidal marsh ecosystem. If not, the site would be adaptively managed to promote full tidal exchange and tidal marsh development. Options include increasing the size of the natural breach, deepening the natural breach, or creating additional breaches in the exterior levee. The likely location of an additional breach would be at 55+00.

2.4 Construction Methods

The levee would be breached during one low tide cycle, and would be scheduled to coincide with the lowest (projected) tide during the available construction window. The typical maintenance and construction period in the Suisun Marsh is May through October 15th. The site would not be dewatered.

Construction would commence upon obtaining regulatory approval and is projected to occur prior to Oct 1, 2006. If all necessary regulatory permits have not been received by this date, DWR and USBR would confer with SRCD and the regulatory agencies to schedule construction.

In each location a 65 foot (20 meter) breach would be constructed using a long-reach excavator (Figure 2). A maximum of 1000 yards of material would be excavated from each breach. Excavated material would be placed in the borrow ditches as ditch blocks to a level not to exceed MLLW. Any material placed in the ditches would not be compacted, but left as placed.

The material from the breach at 55+00 would be placed in the ditches on both sides of the proposed breach. This would cover an area of approximately 4200 square feet (filling the ditch to MLLW). The material from the breach at 25+00 would be placed in only the east side of the breach, covering an estimated area of 4050 square feet, filling the ditch to MLLW. These estimates were calculated using dimensions of the borrow ditches, site elevations and tidal datum.

If additional material is available (that cannot be placed in the ditch blocks as proposed), and if it is feasible to transport, may be used to raise low areas of the exterior levee between 64+00 and 69+00 (Figure 5). Material would only be placed on the crown and would be graded when dry.

All heavy equipment would access the site from the levee. Access for heavy equipment would be from Shiloh Road, through the Blacklock Ranch (ownership 604), and to the site. DWR acquired an easement through this parcel when the restoration site was acquired in 2003. Excavation of a breach should be accomplished during one low tide period. Construction would be scheduled to coincide with the daylight low tides in September, assuming environmental clearances and permits have been obtained.

Dissolved oxygen would be monitored within the pond prior to breaching. Water would be exchanged and circulated, to the extent possible, using the water control structure. The breach at 55+00 would be completed first. This would allow for the exchange of pond water to enter Little Honker Bay, which has a larger volume than Arnold Slough.

During construction activities, avoidance and minimization measures and Best Management Practices for in-channel construction would be followed to ensure that this project is completed with minimal environmental impacts. A biologist would be on site at all times during construction.

2.4.1 Avoidance and Minimization Measures and Construction Best Management Practices

1. All work would be done between May 1 and October 15, described as the Suisun Marsh construction/maintenance period described in SRCD/DFG regional general permit #N214515 issued by the USACE.
2. Locations of levee breaches would be sited to avoid sensitive habitat, including potential SMHM habitat, where practical.
3. Pre-construction surveys for sensitive plant species would be done prior to commencement of work.
4. SMHM would be surveyed at the breach locations prior to excavation according to the protocol specified in USFWS permit #835365-3. This permit authorizes DWR to sample for SMHM within the Suisun Marsh. Surveys would be conducted for 7 consecutive days. If SMHM are present at specific breach locations:
 - The captured SMHM would be relocated to a suitable alternate location on the property and the FWS would be immediately notified.
 - Surveys would continue until no SMHM are captured for 5 consecutive days.
 - Vegetation would then be hand-removed, followed by another trapping sequence.
 - Construction can commence after SMHM are NOT detected for 5 consecutive days after vegetation removal.
5. If SMHM are not present, vegetation would be removed (by hand) from breach locations immediately following surveys.
6. A qualified (permitted) biologist would walk in front of the excavator as it moves down the levee towards the breach location to flush any SMHM that may be in the vegetation on the levee crown and shoulders.
7. Excavating equipment would work from levee crown. No equipment shall be operated in the water.
8. No intentional harassment, killing, or collection of plants or animals at or around the work site would occur.
9. Disturbance of vegetation shall be kept to a minimum. Trees would be flagged and avoided during construction.
10. No firearms are allowed on site, except for those used by peace officers or DFG wardens.
11. No pets would be allowed.

12. All persons would stay within the boundaries of the work site, which is the top of the levees and the water side levee slopes.
13. All trash, including food-related trash and cigarette butts, would be properly disposed of and removed by the workers.
14. Storage of hazardous materials, such as fuel, oil, etc. would not be allowed within 150 feet of waterways. Any chemical spills would be cleaned up and reported immediately.

This plan includes provisions for water quality protection and for implementing Best Management Practices (BMPs) chosen to mitigate for construction activity pollutants. These measures are intended to prevent/minimize runoff into waterways and erosion. The Contractor shall implement this plan by providing BMPs and conforming to the following provisions, where applicable:

1. Restrict personnel to designated roads.
2. Use methods for controlling erosion on designated roads.
3. Use methods for on-site erosion control and sediment capture methods during construction.
4. Minimize erosion during stormy weather at the work site.
5. Use methods for post construction erosion control.
6. Contact personnel and emergency procedures would be posted at the work site to avoid and minimize loss of property and life in case of a significant storm event.
7. The project RWQCB Water Quality Certification conditions would be strictly implemented.
8. All settleable solids, oils, and grease shall be contained to prevent their release into the environment. Flocculents may be used on solids that do not readily settle, as long as they do not degrade water quality.
9. Excess construction and operation materials, rubble, and excavated soil shall be either reused or disposed of in approved sites.
10. Exposed areas shall be stabilized with temporary mulching, or other erosion control methods during and after land disturbance activities.
11. Areas of disturbance with slopes toward a stream shall be stabilized to reduce erosion potential.
12. Stock piles shall be protected from erosion either by covering them or by placing barriers (e.g. silt fence, sand bags) around their perimeter to prevent the escape of sediments.
13. Spoil disposal areas shall be graded to ensure that drainage from these sites would minimize erosion of spoil materials and adjacent native soil material. Grading shall conform to the existing topography of the area.

14. Any construction measures shall be inspected during day light hours and after normal working hours during adverse weather conditions to observe proper operation. Any measure not operating properly or effectively shall be corrected immediately.
15. All reasonable efforts would be made to avoid on-site fueling. If fueling is done at the job site, containment shall be provided in such a manner that any accidental spill of fuel shall not be able to damage vegetation, enter the water or contaminate sediments that may come in contact with water.
16. All reasonable efforts would be made to avoid on-site servicing of equipment. If emergency repairs are required, containment shall be provided to avoid accidental spills from entering any channel or damage stream vegetation.
17. Measures shall be implemented to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means.
18. Prior to entering the work site, all field personnel shall know how to respond when toxic materials are discovered.
19. The discharge of any hazardous or non-hazardous waste as defined in Division 2, Subdivision 1, Chapter 2 of the California Code of Regulations shall be conducted in accordance with applicable State and federal regulations.
20. Field personnel shall be appropriately trained in spill prevention, hazardous material control, and clean-up of accidental spills.
21. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations).
22. Prior to entering the work site, all field personnel shall know the location of spill kits on crew trucks and at other locations within District facilities.
23. All field personnel shall be advised of these locations and trained in their appropriate use.
24. In the event that archaeological resources are encountered during construction on the property, work in the immediate vicinity of the find shall be halted until all requirements relating to archaeological discoveries have been satisfied.

2.5 Monitoring

This section describes the monitoring program that would accompany the Blacklock Restoration Project. The goals identified for this project include: 1) avoidance of adverse impacts from construction and restoration activities, and 2) restoration outcome monitoring.

2.5.1 Construction Monitoring

Monitoring activities designed to avoid and minimize impacts during construction are described above in Section 2.3.1 and in Chapter 3, Affected Environment and Environmental Consequences of the Proposed Action and Alternatives.

2.5.2 Restoration Outcome Monitoring

Monitoring would both document the expected beneficial effects of this project and detect potential impediments to successful marsh restoration as well as potential adverse outcomes. Monitoring for each of the performance criteria would continue until performance criteria are satisfied. If performance criteria are not met, the causes would be investigated and adaptive management actions/corrective measures would be implemented. It is anticipated that some elements of the monitoring program would become part of regional monitoring programs currently in place and developed in the future.

The performance criteria for the Blacklock Restoration are:

- High tide heights inside the site will be substantially similar to those observed outside the site, within two years following a planned or unintentional breach.
- Low tide heights inside the site will be no more than 1 foot greater than those observed outside the site, within two years following a planned or unintentional breach.
- Restored marsh plain elevations will continually trend upwards.
- Native tidal marsh species will colonize and establish at the site. Total percent cover shall be at least 50%. Species composition will be those species appropriate to the salinity regime and site elevations.

Monitoring components include:

- Inundation regime
- Levee breach geometry
- Surface elevation changes/sedimentation
- Slough network evolution
- Native marsh vegetation development
- Invasive plant species establishment
- Water quality including production of methyl mercury
- Nurse Slough monitoring network
- Aquatic species utilization
- Wildlife use

A preliminary monitoring plan and schedule is presented in Appendix A. Detailed monitoring plans would be developed in during the ESA consultation process.

2.6 Adaptive Management

Adaptive management means taking informed, intentional actions designed to achieve pre-defined goals and objectives, observing the effects of those actions over a prescribed time period, evaluating the observed outcomes of those actions against a set of pre-defined criteria, and determining whether further actions should be taken based on those evaluations (Lee, 1993). In this adaptive management framework, it is critical to consider up-front what range of *feasible* actions could be taken, so that monitoring and decision making are focused on elements where intervention is possible and likely to have a measurable effect.

Whether tidal inundation occurs at Blacklock under a planned or unplanned event, adaptive management would be incorporated, as needed, to meet project goals and objectives. Physical and biological parameters would be monitored to evaluate success in meeting desired outcomes and to minimize undesirable outcomes. Physical parameters including tidal regime and breach geometry would be used as an indicator for future actions. Monitoring these physical parameters, in addition to using the computer model as a predictive tool, would inform project planners on specific actions that might be implemented. One important component of biological monitoring would be the use of this restoration site by listed species. Adaptive management would be incorporated, as needed and practical, to meet the goal of providing suitable habitat for listed species.

Because the existing conditions of the exterior levees suggest that levee failure would occur in some location other than our preferred breach location, deepening or widening of the breach may be required to achieve full, unimpeded tidal flow. Under the unplanned breach scenario, site conditions would be monitored and observed for at least one year to allow time for evolution of the breach.

The Adaptive Management Program for the Blacklock Restoration Project consists of the following elements:

- Milestone #1: At one year following breach (whether planned or unintentional), results of several monitoring parameters would be evaluated to determine whether any further actions are needed: the degree of tidal inundation, amount of sedimentation, breach geometry evolution, vegetation community changes, mosquito production, and invasive species colonization. These data would inform whether levee breaches need to be enlarged, new levee breaches added, or invasive vegetation control needed.
- Milestone #2: At two years following implementation of any changes following review at Milestone #1, results of the same parameters plus overall wildlife use and aquatic species use would be evaluated. These data would inform whether any final measures are warranted to alter the course of the site development to promote meeting its goals and objectives.
- Monitoring data review: In between and following these two milestones, monitoring data would be reviewed along with site observations made during monitoring, for early detection of desired or undesirable outcomes. If these reviews indicate clear adverse conditions prior to reaching either milestone, actions under those milestones would be moved forward as deemed appropriate by DWR and its Advisory Team.

2.7 Maintenance

2.7.1 Cross Levee Maintenance

To prevent flooding of the adjacent Blacklock Ranch, Ownership #604, the cross-levee was raised to 9.0 feet NAVD during 2004. During 2005, additional material was added to the cross-levee to restore the 2:1 side slope on the proposed restoration side of the levee. The base of the cross-levee was revegetated with *Schoenoplectus californicus* in December 2005. Brush boxes were installed on the cross-levee slope in late 2005 and January 2006 to provide wavewash erosion protection. In addition, woody vegetation was planted on the levee slope above the brushboxes. The brushboxes are expected to provide erosion protection for 3-5 years, giving time for the revegetated levee to mature. This alternative approach to protect the levee slope would be evaluated for effectiveness. If the brushboxes do not provide adequate protection, additional measures would be considered.

The east (non-project) side of the levee sustained moderate damage during the January 2006 storm and high tide event. The adjacent property flooded during the high tides and wind fetch across the open water of the adjacent parcel resulted in erosion to the east side of the cross levee. Once permits and material are obtained, this side of the levee would be repaired and revegetated. Maintaining the cross levee is, and would continue to be, a high priority.

2.7.2 Exterior Levee Maintenance

Maintenance on a portion of the exterior levee from 55+00 to 75+00 would continue to occur until the levee is breached at 55+00. In the event of an unintended levee failure, maintaining the levee from 55+00 to 75+00 is necessary to allow the excavating equipment access to the preferred breach location, unless a decision is made that a breach at the preferred breach location is not necessary. Sections of this levee, specifically around 64+00 through 69+00 are some of the lowest on the property, and frequently overtop at tides over 6.2 feet NAVD. However, since there is a wide fringing marsh in this location, which dissipates the energy of the high tides, this area does not have the heavily eroded waterside slope of other areas. Maintenance of this levee would likely include placing imported material to raise the levee and maintain access for equipment necessary to breach the levee, if needed.

In addition, the exterior levee would also be maintained from 11+00, the end of the cross levee, to 25+00 until a determination is made that unimpeded tidal exchange is achieved. Maintaining this section of levee along Arnold Slough would allow access from the cross levee to the water control structure and culvert under the well pad road.

Vegetation control including mowing and weed control would continue along the crown of the exterior levee to allow pedestrian access for as long as is practical. This would allow agency staff and those involved with the restoration access to evaluate levee and site conditions, and conduct monitoring. Access would be limited to foot traffic and ATV's since the levees are unsafe for larger vehicles.

It is expected that the remaining exterior levees would erode over time, resulting in additional breaches.

2.7.3 Invasive Species Control

Exotic plants and animals often thrive under conditions at wetland restoration sites (Zedler, 2000). A program for the control of non-native invasive plant species would be developed as part of the vegetation monitoring plan for this project. Control of aquatic invasive species is likely to be difficult and would be best achieved by providing conditions more favorable to native species.

2.8 Permits

The following environmental regulatory requirements will be obtained:

- A Joint Aquatic Resource Permits Application (JARPA) was prepared and submitted to the appropriate agencies to address the following regulatory requirements:
 - Clean Water Act Section 10 and 404 – Nationwide Permit 27 Wetland Restoration Activities; USACE Regulatory Division, San Francisco;
 - Clean Water Act Section 401 – State Water Resources Control Board, San Francisco Bay Region 2, Water Quality Certification notification;

o San Francisco Bay Conservation and Development (BCDC) permit

- Federal Endangered Species Act – USBR is consulting with USFWS and NMFS Fisheries on potential effects of the action to listed, proposed, and candidate species;
- California Endangered Species Act – DWR is consulting with the California Department of Fish and Game on sensitive species concerns;
- California Environmental Quality Act (CEQA) – This Initial Study is being prepared in compliance with CEQA. As a result of the findings of this document, a Mitigated Negative Declaration will be filed with the California Office of Planning and Research.
- National Environmental Policy Act (NEPA)- This Environmental Analysis is being prepared in compliance with NEPA. Based on the results of the analysis, Reclamation has prepared a draft finding of no significant impact (FONSI).
- Magnuson-Stevens Fishery Conservation and Management Act – USBR is consulting with NMFS on potential effects of the action on designated Essential Fish Habitat; and,
- National Historic Preservation Act Section 106 – Consultation within DWR & USBR will address this issue.

3.0 ENVIRONMENTAL SETTING, AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

3.1 Introduction

The environmental setting describes the physical features of the project area; the affected environment describes the existing conditions of environmental resources, including biological resources in the project area that may be affected by the proposed action and alternatives. The "environmental consequences" section forms the scientific and analytic basis for the comparison of alternatives, comprising the proposed action and no action.

A comprehensive list of Federal endangered and threatened species that occur or may be affected in the Denverton U.S.G.S 7 ½ minute quad (Appendix B) was generated online on June 28, 2006 at http://sacramento.fws.gov/es/spp_lists/auto_list.cfm. Because this list includes all species found on the quad maps, which is a larger geographic area than the proposed action area, several species are included on the list would not be affected by the proposed action and are not be evaluated in this document.

To meet CEQA requirements, an environmental checklist was prepared and is included as Appendix C. Explanations of items evaluated to be 'less than significant impact' are included at the end of the checklist. None of the proposed actions were considered 'less than significant with mitigation incorporated' or 'potentially significant' impacts.

The following features of the project area are described below in the environmental setting:

- Regional biology
- Ecosystem types
- Climate
- Topography
- Soils
- Hydrology
- Suspended sediment concentrations
- Land use
- Constraints
 - Levees
 - Abandoned gas wells
 - Vector control

The following environmental resources are analyzed in this environmental assessment/initial study.

- Upland communities (including noxious weeds) and wildlife habitat
- Wetland plant communities and special status plants
- Terrestrial endangered species
- Fish and aquatic special status species
- Recreation
- Water Quality
- Air Quality
- Cultural Resources
- Indian Trust Assets

- Environmental Justice

This document assess effects of the proposed action on the following ESA listed species:

- Salt marsh harvest mouse (USFWS)
- California clapper rail (USFWS)
- Central Valley steelhead (NMFS)
- Central Valley spring-run Chinook salmon (NMFS)
- winter-run Chinook salmon and winter-run Chinook salmon critical habitat (NMFS)
- Delta smelt and Delta smelt critical habitat (USFWS)
- Green sturgeon (NMFS)
- Suisun thistle (USFWS)
- Soft bird's-beak (USFWS)

This document assess project effects on the following Species of Concern:

- Saltmarsh common yellowthroat (USFWS)
- Suisun song sparrow (USFWS)
- California Black rail (USFWS)
- Mason's lilaepsis (USFWS)
- Suisun Marsh aster (USFWS)
- Delta tule-pea (USFWS)
- Suisun ornate shrew (USFWS)
- Western pond turtle (USFWS)

This document assess project effects on the following Essential Fish Habitat:

- Coastal Pelagic Fishery Management Plan
 - Northern anchovy (NOAA Fisheries)
 - Pacific sardine (NOAA Fisheries)
- Pacific Salmon Fishery Management Plan
 - Fall-run and late fall-run Chinook salmon (NOAA Fisheries)
- Pacific Groundfish Fishery Management Plan
 - Starry flounder (NOAA Fisheries)

Action Area

The action area includes all areas to be affected directly or indirectly by the project and not merely the immediate area involved in the action. The action area for this project includes the entire 70 acre property, adjoining sloughs and portions of Little Honker Bay in the vicinity of the preferred breach location (Figure 2).

Basis of Comparison

The basis of comparison under NEPA is the no action conditions.

3.2 Environmental Setting

3.2.1 Regional Biology

The regional biology of the Suisun Marsh is described in general in the Bayland Habitat Goals Report (1999) and the final report prepared in 2001 by the Suisun Ecological Workgroup at the request of the State Water Resources Control Board. This report can be found on line at

http://www.iep.ca.gov/suisun_eco_workgroup/final_report/SEWFinalReport.pdf. Most of the Suisun Marsh is

diked seasonal wetlands managed for waterfowl habitat. A few tidal marshes remain along Suisun and Cutoff Sloughs (Rush Ranch), Hill Slough, and Peytonia Slough. Marsh ponds exist to a limited extent in low areas of diked baylands.

3.2.2 Ecosystem Types

The site is characterized by 3 main ecosystem types: upland, seasonal wetland, and aquatic. The upland areas of the site are restricted to the levees and the abandoned well pad. The sloughs and pond areas comprise the aquatic areas of the site; over the past several years, water has remained in the central portion of the site year-round. Before inundation in January 2006, the majority of the site was a managed seasonal wetland. The distribution of vegetation present is primarily a function of the topography on the site and inundation due to water management. Analysis of the project on these ecosystem types is presented in section 3.3 below.

3.2.3 Climate

Climate in the project area, like much of this part of Solano County is characterized by hot, dry summers and cool winters. In the summer, there is a steady marine wind (delta breeze) that blows up through the Suisun Marsh. Average annual rainfall in Solano County ranges from 16 inches to 30 inches per year. The monitoring station installed at the project location measures precipitation, wind speed and direction and barometric pressure. Because the station was only installed in 2004, long-term data is not yet available from this station.

3.2.4 Topography

The Department of Water Resources conducted a field elevation survey of the site in August 2002. Figure 3 shows the digital elevation model (DEM) created by DWR and updated by WWR using the topographic data. Elevations at the site range from approximately -1.9 feet up to 9.2 feet (NAVD 88). With the exception of the levees and the two well sites, most of the property is subsided, with elevations less than about 3 feet and less than about 1 foot on most of the site. The mean sea level at this location is approximately 4 feet. Additional elevation surveys were conducted on the perimeter borrow ditch and slough network during 2005.

3.2.5 Soils

The U.S. Department of Agriculture soil survey for Solano County (USDA 1975) shows only two soil types at the Site. The area inside the levee is Tamba Mucky Clay, and Tidal Marsh soils are present outside the levees.

The Tamba soil series consists of very poorly drained, fine-textured soils with a high organic matter component. The soils occupy nearly level salt and brackish water marshes and are formed in mixed alluvium from mixed sources and hydrophytic plant remains. In a typical profile, the mucky clay extends to a depth of more than five feet.

This very poorly drained soil is moderately permeable. The surface runoff is ponded and the erosion hazard is slight to none. The total available water holding capacity is 3-5 inches. The effective rooting depth is shallow and the soil has low fertility. Areas with this type of soil association are typically used for wildlife habitat, recreation (irrigated duck ponds) and grazing.

The tidal marsh soil is a very wet, poorly drained, and strongly saline soil type that has unobstructed access to tidal water. This land ranges from unvegetated mud flats that are inundated daily by tidal flow to a mixture of hydrophytic plant remains and alluvium that is covered by water only at high tide and are (at this site) thickly

vegetated with *Schoenoplectus Bolboschoenus* and *Typha*. Permeability and runoff rates are low with these soils. Effective rooting depth is very shallow and fertility is very low. This land type is used for wildlife habitat and recreational uses. (US Department of Agriculture, 1975)

3.2.6 Hydrology

Because of the location and relative isolation of the parcel, there are no watershed inflows that would affect the hydrology of the site except under extreme tidal/flooding scenarios as occurred in 1998, 2005 and 2006. Tidal inundation, as described below, along with site elevation, has the greatest influence on the development of a fully functioning tidal marsh. As a managed wetland, the hydrology of the site was primarily controlled by one 36-inch water control structure located along Arnold Slough (Figure 4); however, holes and seepage through levee and uncontrolled intermittent levee overtopping also impacts water levels. The pond has been flooded since January 2006.

Water Control

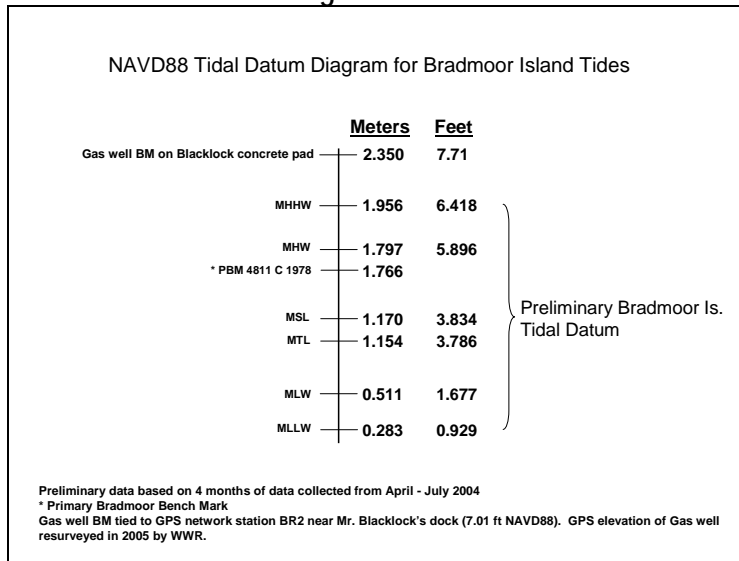
There is one water control structure for both flooding and draining the property. The structure consists of a 36-inch corrugated metal pipe with a screw-flap gate on the slough side and a winch flap gate on the interior side. The gate was installed in the summer of 1998 and is in good working order. There is also a 48-inch pipe under the road to the well pad to allow circulation in the borrow ditch that runs along the interior toe of the levees. This culvert under the road was replaced with high density polyethylene (HDPE) pipe in August 2005. A flashboard riser was installed on the west side of the pipe, and would be closed upon breaching of the levee to reduce circulation in the perimeter borrow ditch.

Tidal Datum

A water quality monitoring station was installed at the northeast corner of the Blacklock property (Figure 4). This station monitors tide stage, electrical conductivity (EC) and temperature in Denverton /Little Honker Slough. The station also monitors precipitation, wind speed and direction. In addition, a pressure transducer was installed in the borrow ditch of the Blacklock property to monitor interior water levels. After breaching, this sensor would provide data on the extent of tidal inundation. This station is identified as BLL on the California Data Exchange Center (CDEC) network. Hourly data is available on-line at <http://cdec2.water.ca.gov/cgi-progs/queryFx?s=bll>.

Additionally, DWR contracted with the National Oceanographic and Atmospheric Administration's Ocean Service / Center for Operational Oceanographic Products and Services (NOS/CO-OPS) to install a water level observation gauge on Bradmoor Island in 2004 where it had previously operated a station in the 1970's (Station ID NOS 941-4811). The purpose of the gauge is to determine the tidal datum (heights and range of the tides) for the Nurse Slough/Denverton Slough complex in the northeast Marsh, in the vicinity of the Blacklock property. Tidal datum from Bradmoor Island is presented in Table 1.

Table 1 - Tidal Datum Diagram of Bradmoor Island Tides



Existing Slough Network

There are remnants of the historic tidal marsh slough network on the site. DWR surveyed slough topography as part of its August 2002 survey. To supplement the original survey, additional surveys of the slough bottoms were conducted in March 2005. These remnant sloughs range in width from 5 to 15 feet and in depth from ½ to 2 feet across the site. In addition, there is a perimeter borrow ditch around the property along the interior toe of the exterior levee. Over the years, material has been removed from this ditch and used to maintain the levees. An elevation survey of this ditch was conducted in 2005. The width of the borrow ditch varies from approximately 10 feet to 35 feet wide and extends into ponded areas at several locations throughout the parcel.

3.2.7 Suspended Sediment Concentration

Researchers at San Francisco State University conducted in-situ suspended sediment sampling at two locations (Little Honker Bay and Arnold Slough) outside the Blacklock site from 2004 through 2006. A detailed description of the sampling methodology and results are presented in Appendix A.

In Little Honker Bay, suspended sediment concentrations (SSC) ranged from a low of about 20 mg/L to nearly 500 mg/L, with most values being less than 200 mg/L. Data shows a small spring-neap tide cycle signal. SSC tended to be higher in the winter and spring months and lowest in the fall months. At Arnold Slough, concentrations ranged from a low of about 30 mg/L to a high of about 430 mg/L, with most values being less than 150 mg/L. Arnold Slough shows the same seasonal pattern observed at Little Honker Bay.

The SSC difference between the two stations shows greater SSC values at Little Honker Bay during winter, spring and summer months, with the difference ranging from 10-30 mg/L commonly and in some instances up to 200 mg/L. Values were higher at Arnold Slough during the fall, by about 10-20 mg/L typically.

These results provide two beneficial pieces of information. First, they indicate that a reasonable sediment supply exists to support natural sedimentation within the Blacklock site. The values observed are within commonly seen ranges elsewhere in the San Francisco Estuary where natural sedimentation is known to occur in tidal marsh restoration sites (PWA and Faber 2004). Sediment accretion would be measured by using the three Sediment Erosion Tables installed within the project area (Figure 4). Second, these data can support sediment transport

modeling that DWR may undertake after project construction to develop more insight into physical processes promoting tidal marsh restoration in Suisun.

3.2.8 Land Use

The Blacklock restoration site was owned and operated by the Blacklock family since 1936, and was used for livestock grazing and duck hunting activities since 1946 (DWR 2003). The past owner used the entire Blacklock Ranch property primarily for grazing, with some waterfowl hunting in the southwest portion of the Blacklock Ranch including the 70 acres acquired by DWR. Management on the wetland area was minimal, consisting primarily of flooding and circulation during duck hunting season. Prior to DWR ownership, levee maintenance appears to have been minimal and inadequate to protect the property from occasional tidal overtopping. The levees were maintained primarily by borrowing material from the interior toe ditch. It appears that rip-rap was periodically imported to maintain a portion of the exterior levee along Little Honker Bay.

Since acquisition, and through restoration planning, DWR has maintained the property as a managed wetland and followed an "interim management" strategy of moist soil management to encourage the growth and spread of emergent vegetation on the site and allow for circulation throughout the property. Water control on the site is achieved through the existing 36-inch culvert. In late summer of both 2004 and 2005, the pond was drained (to the extent possible) to allow for construction work on the cross levee. Once levee construction was completed, the property was re-flooded to previous levels.

The property includes approximately 1.5 miles of levees consisting of 1.3 miles of exterior levees and approximately 0.2 miles of an interior "cross" levee. The exterior levees are along Little Honker Bay or adjacent sloughs. DWR surveys conducted during summer 2004 indicate the elevations of the exterior levees range between 6.4 and 9.2 feet NAVD, with an error of 0.5 foot. Overtopping of the levee occurs in several locations during high tides. Figure 5 shows the locations where the levee is less than 7 feet NAVD and susceptible to overtopping in high tides. The width of the levee crown is variable, ranging from 6 to 10 feet.

The exterior levees are in extremely poor condition. There is significant erosion in many locations and large holes through the levee (Figure 2). Seepage through the levee occurs in several locations at high tides.

Cross-Levee

There is a short interior levee (~1,100 feet) between the Blacklock property and the adjacent Blacklock Ranch. Because the poor condition of the exterior levees on the property poses a risk for levee failure and unplanned breaching, this cross levee was raised to elevation 9 feet during September and October 2004. The nine foot elevation would protect the adjacent property from flooding in the event of an unplanned levee failure, and minimize DWR's flood liability, when the property is opened to the tides. All levee work was authorized under the USACE regional general permit 24215N issued to SRCD and DFG. The RGP sets limits on the quantity of material each property is allowed to place; thus DWR was unable to import sufficient material to construct the levee with the desired slope during 2004. Additional material was placed on the (west) slope during the 2005 construction season to restore a 2:1 side slope to the levee. Imported material was used to raise the levee. The material was tested for contaminants prior to placement.

During January 2006, the levee slope and toe was revegetated with *Schoenoplectus californicus* (previously called *Scirpus californicus*). This species would remain viable during the winter months. It is anticipated that this species would colonize up the levee slope with inundation of the parcel when tidal action is introduced to the site.

To protect the levee slope from wind and wave erosion, brush boxes were installed on the cross levee slope in early 2006 as an alternative to rip rap for levee slope protection. Brush boxes are constructed by driving 2

parallel rows of 3-inch diameter wooden poles along the levee slope. Recycled Christmas trees were placed between the poles and secured in place. This method has been used successfully in other areas of Suisun Marsh and in the Sacramento-San Joaquin Delta.

Under existing conditions, the adjacent Blacklock Ranch floods via overtopping of its levees under extremely high tides. This condition occurred during the January 2006 storm event. This flooding is unrelated to the Blacklock Restoration Project. Therefore, while maintaining the cross levee to maintain existing levels of flood protection is a high priority for this project, the purpose is to maintain existing levels of flood protection provided by the restoration site, and not to protect adjacent lands from any flooding.

3.2.9 Constraints

3.2.9.1 Levees

The property includes approximately 1.5 miles of levees consisting of 1.3 miles of exterior levees and approximately 0.2 miles of an interior "cross" levee. The exterior levees are along Little Honker Bay or adjacent sloughs. DWR surveys conducted during summer 2004 indicate the elevations of the exterior levees range between 6.4 and 9.2 feet NAVD, with an error of 0.5 foot. Overtopping of the levee occurs in several locations during high tides. Figure 5 shows the locations where the levee is less than 7 feet NAVD and susceptible to overtopping in high tides. The width of the levee crown is variable, ranging from 6 to 10 feet.

The exterior levees of this parcel are in poor condition and continue to deteriorate. Areas of severe erosion have been documented since DWR acquired the parcel in December 2003 and have worsened over the years. Attempts to repair the most severe areas were attempted in 2004, but were unsuccessful. During winter 2005-06, two significant holes through the levee developed, at stations 14+00 (Arnold Slough side) and at 52+00 (Little Honker Bay Side). In addition, there are several other locations where seepage occurs at higher tides. Although the hole at 14+00 was repaired in April 2006, there is still more water flowing into the site than draining out, thus leaving the parcel in a flooded state.

There is a short interior levee (~1,100 feet) between the Blacklock property and the adjacent Blacklock Ranch. During 2004 and 2005, the cross levee was raised to 9 feet NAVD to protect the adjacent property from flooding in the event of an unplanned levee failure, and minimize DWR's flood liability, when the property is opened to the tides. All levee work was authorized under the USACE regional general permit 24215N issued to SRCD and DFG. Imported material was used to raise the levee. The material was tested for, and found free of contaminants prior to placement.

3.2.9.2 Abandoned Gas Wells

The property contains two abandoned gas wells. The well pad for Blacklock Number One was dismantled and removed from the site; while the well pad for Blacklock Number Two is still intact (Figure 4). Remnants of the roads leading to the well pad still exist on the site. Details on abandonment of these gas wells are described in the Appendix A.

3.2.9.3 Vector Control

Since acquiring the property, DWR has worked cooperatively with the Solano County Mosquito Abatement District (SCMAD) to control mosquito production on-site. SCMAD has developed policies for management of tidal marsh restorations. DWR would continue to work cooperatively with SCMAD.

3.3 Affected Environment and Environmental Consequences of the Proposed Action

3.3.1 Upland Communities and Wildlife Habitat

Affected Environment

The upland habitat in the action area is primarily confined to the levee crown and shoulders, although there is a limited amount of upland area in the location of the well pad. Most of this habitat is of poor quality. The habitat consists primarily of fragmented non-native weeds along the levee crown. There is no connection to the nearby contiguous grassland habitat.

Local plant surveys of the action area were conducted in December 2003, and additional surveys will be conducted prior to project initiation as required. The purpose of these surveys is to identify the presence of any special status plants, and to assess present vegetation communities. Common plant species growing at the project site include the following: tules (*Schoenoplectus [Scirpus] acutus*, *S. californicus*), California rose (*Rosa californica*), cattails (*Typha latifolia*, *T. angustifolia*), wild radish (*Raphanus sativus*), blackberry (*Rubus discolor*), saltgrass (*Distichlis spicata*). No sensitive plant species were found in the action area.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. The amount of upland vegetation and the current management practices would not change under the no action alternative. There would be no change in upland habitat from existing conditions described above.

Environmental Consequences of the Proposed Action and Alternative Action

The proposed action would remove about a 65 foot length of levee crown, in two locations along the levee (stn. 25+00 and stn. 55+00). The proposed action would result in a nominal change in the quantity and quality of upland habitats, thus, the proposed action would not adversely affect wildlife that use the upland plant community within the action area.

3.3.2 Terrestrial Special-Status Species

3.3.2.1 Salt Marsh Harvest Mouse *Reithrodontomys raviventris*

Affected Environment

The salt marsh harvest mouse (SMHM, *Reithrodontomys raviventris*) is a federal and State endangered species endemic to the brackish and salt water marshes around the San Francisco Bay Estuary. There are two subspecies, and it is the northern subspecies, (*R.r. haliocetes*), that is found in the Suisun Marsh. SMHM are dependent on the thick, perennial cover of salt marshes and move in the adjacent grasslands only in the spring and summer when the grasslands provide maximum cover (Fisler 1965). Their preferred habitats are the middle and upper portions of salt marshes; i.e., the pickleweed (*Salicornia virginica*) and peripheral halophyte zones and similar vegetation in diked wetlands adjacent to the bay (Shellhammer et al. 1982, 1988).

The Blacklock parcel has been flooded since late December 2005. Even before flooding, SMHM habitat was limited at Blacklock, and capture success has been fairly low, and decreasing year by year. DWR biologists estimated less than 10% (5-10 acres) of the total habitat of the property was suitable SMHM habitat, and that habitat was of poor quality. Outside the pond, SMHM have been captured along the levee (in low numbers).

These mice may be primarily inhabiting the tidal fringe on the outside of the levee and using the levee as high tide refugia. Details of the 2003-2005 SHMH surveys are presented in Appendix A.

Several areas of the pond which are dominated by saltgrass have been surveyed with negative results. Since DWR acquired the parcel in 2003, most of the interior of the pond has been vegetated with tall emergents such as *Scirpus*, *Typha* and *Phragmites*. There is a great deal of perennial water in these areas which, coupled with the dense vegetation, has prevented surveying these areas. However, DWR and DFG biologists have conducted SMHM surveys in similar vegetation in other areas of the marsh, and these surveys have resulted in captures of no SMHM or single captures of one or two individuals.

Because the pond is flooded, the only potential habitat remaining on the property is the levees.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. The terrestrial habitat would continue to be managed for waterfowl, as in the past. There would be no change or impact to habitat conditions or amounts.

Environmental Consequences of the Proposed Action

Because the pond was flooded in December 2005, breaching the levee is expected to have no significant adverse impact on SMHM populations. Prior to flooding of the pond, based upon survey results and vegetation in which SMHM had been captured, it was estimated that there were only 5-10 acres of SMHM habitat within the pond. SMHM surveys from 2003-2005 showed a decreasing trend in SMHM numbers, indicating that the habitat was declining in suitability for the species, probably due to an increase in saltgrass and decrease in pickleweed.

After tidal action is restored to the area, mid and high marsh would develop in the pond, and there would be an increase in SMHM habitat, providing a significant benefit to the species.

After tidal inundation, SMHM trapping at Blacklock would be conducted annually, on any available habitat and would continue as habitat develops on the site. SMHM surveys would continue until survey results are stable.

Direct Effects

Because the pond was flooded during the winter of 2005/2006 and has remained flooded with 1-2 feet of water since then, all SMHM habitat within the pond is inundated. It is assumed that all SMHM that were resident within the pond were forced to higher ground by this flooding. Therefore, when the levee is breached, the introduction of tidal action is expected to have no impact on SMHM.

SMHM have been captured on the levee, so the breaching of the levee may impact SMHM and its habitat. To minimize or eliminate direct effects to SMHM, several actions will be taken prior to breaching the levee.

1. SMHM will be surveyed at the breach locations prior to excavation according to the protocol specified in USFWS permit #835365-3. This permit authorizes DWR to conduct SMHM sampling within the Suisun Marsh. Surveys will be conducted for 7 consecutive days. If SMHM are present at specific breach locations:
 - The captured SMHM will be relocated to a suitable alternate location on the property and the USFWS will be immediately notified.
 - Surveys will continue until no SMHM are captured for 5 consecutive days.
 - Vegetation will then be hand-removed, followed by another trapping sequence.
 - Construction can commence after SMHM are NOT detected for 5 consecutive days after vegetation removal

2. Vegetation at breach locations will be removed by hand prior to breach construction even if SMHM are not detected by protocol surveys.

These actions should ensure that there are no SMHM within the area at the time of breaching, and that no SMHM are impacted by the excavation of the levee.

Indirect Effects

To avoid direct mortality to SMHM, the breach areas will be trapped and captured mice will be moved to suitable habitat along the Blacklock levee. In 2005 approximately 150 linear meters of the levee were trapped and only one SMHM was captured. The area trapped at the two breach locations will be smaller than the area trapped in 2005, so we expect to capture only 0-2 SMHM. Although these mice may experience some temporary indirect effects from being translocated to unfamiliar habitat, because so few are expected to be captured, we expect these indirect effects not to be substantial.

3.3.2.2 California clapper rail

Rallus longirostris obsoletus

Affected Environment

The California clapper rail occurs primarily in emergent salt and brackish tidal marshlands of San Francisco Bay. Preferred habitat is subject to direct tidal circulation and is characterized by predominant coverage by pickleweed (*Salicornia virginica*) with extensive stands of Pacific cordgrass (*Spartina foliosa*) and, in the North Bay, *Scirpus robustus*, abundant high marsh cover, and an intricate network of tidal sloughs which provide abundant invertebrate populations (Harvey, 1988, Collins et al., 1994) as well as escape routes from predators (Zemba and Massey 1983, Foerster et al., 1990). DWR conducted clapper rail surveys throughout the marsh between 1991 and 1994. During this period, clapper rails were detected at several locations in the eastern marsh (DWR 1994). However, no rails were detected east of Suisun Bay. In 2005, DFG conducted California clapper rail surveys throughout the marsh. No clapper rails were detected in the vicinity of the action area (DFG 2004).

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. Terrestrial habitat would continue to be managed for waterfowl, as in the past. There would be no change or impact to habitat conditions or amounts.

Environmental Consequences of the Proposed Action

Numerous surveys since 1979 have not found any clapper rails in or near the project area, so the project is expected to have no effect on this species

3.3.2.3 California black rail

Laterallus jamaicensis coturniculus

Affected Environment

The California black rail prefers *Salicornia*-dominated marsh habitat (Cogswell and Christman, 1977). It is also known to occur in fresh, brackish, and salt marshes (Erlich et al., 1988). In their survey of the San Francisco Bay during breeding seasons from 1986-88, Evens et al. (1991) found the birds occurred almost exclusively in marshlands with unrestricted tidal influence. This study found very few birds associated with diked wetlands, impounded, or partially tidal marshes. Moreover, Evens and his colleagues found that rails during the breeding season were almost exclusively associated with more mature, higher elevation marshes dominated by *Scirpus* and *Salicornia*. Breeding birds were often associated with marshes that had significant amounts of *Scirpus* spp. Subsequent field work indicates that seasonal wetlands with muted tidal flow, especially those adjacent to tidally

influenced marshes, may be utilized by rails in “wet” years when precipitation occurs late in the season and hydrates the substrate of marshes isolated from tidal influence, but supporting a dense cover of salt marsh vegetation; i.e., *Salicornia* (Evens, 1991). Black rail habitat is present in the area of the Blacklock restoration site, but no black rails have been identified in the action area. Black rail require well-vegetated high-marsh and marsh-upland transition zones. It is expected to take several years for this habitat to establish at the Blacklock restoration site. Monitoring for black rails would take place as part of the Blacklock project waterfowl and shorebird surveys.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. Terrestrial habitat would continue to be managed for waterfowl, as in the past. There would be no change or impact to habitat conditions or amounts.

Environmental Consequences of the Proposed Action

Direct Effects

The pond was flooded in December 2005, which negatively altered habitat occupied by California black rails. It is expected that water level changes brought about by breaching the levee would have no additional effects on California black rails. The species is not expected to nest within the pond now that it is flooded. The levee breach would be constructed in late summer or fall, after the nesting season, so construction equipment and related activities would not impact the reproduction of rails that may be resident in adjacent marshes.

Indirect Effects

Over time, as the pond accretes sediment, high and mid marsh would develop, increasing potential habitat for black rails.

3.3.2.4 Suisun ornate shrew

Sorex ornatus sinuosis

Affected Environment

The Suisun shrew is a California Department of Fish and Game Species of Special Concern. It was formerly a category 2 federal candidate, but no longer has any federal status. The Suisun shrew is confined to tidal and brackish marsh communities of the north shores of San Pablo and Suisun bays, from Sonoma Creek, Sonoma County, on the west, eastward to about Collinsville, Solano County. Hays (1980) found that several vegetation types were used by shrews, but generally, they seemed to prefer clumps of *Salicornia* and *Jaumea* in the fall, and were most often found in *Triglochin* in the winter and early spring.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. Terrestrial habitat would continue to be managed for waterfowl, as in the past. There would be no change or impact to habitat conditions or amounts.

Environmental Consequences of the Proposed Action

Direct Effects

Because the pond was flooded during the winter of 2005/2006 and has remained flooded with 1-2 feet of water since then, any Suisun shrew habitat within the pond is inundated. The species is not known to inhabit the pond, but it is assumed that any shrews that were resident within the pond were forced to higher ground by this flooding. Therefore, when the levee is breached, the introduction of tidal action is expected to have no impact on Suisun shrew.

Indirect Effects

Over time, as high and mid marsh habitats develop, these areas may provide habitat for the shrew.

3.3.2.5 Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*

Affected Environment

The saltmarsh common yellowthroat is designated as a species of special concern by the California Department of Fish and Game and a federal species of concern by the U. S. Fish and Wildlife Service. Saltmarsh common yellowthroat use of habitat adjacent to the action area is unknown. Breeding surveys for saltmarsh common yellowthroat adjacent to the action area have not been conducted; however, the species typically prefers thick emergent vegetation for nesting and may be found within close proximity of the action area.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. Terrestrial habitat would continue to be managed for waterfowl as in the past. There would be no change or impact to habitat conditions or amounts.

Environmental Consequences of the Proposed Action

Direct Effects

The pond was flooded in December 2005, and it is expected that water level changes brought about by breaching the levee would not result in substantial effects on saltmarsh common yellowthroats. The presence of water in the pond should not negatively impact this species as they nest off the ground in emergent or woody vegetation and feed on insects. The levee breach would be constructed in fall (September-October), after the yellowthroat nesting season, so construction equipment and related activities would not impact the reproduction of the species.

Indirect Effects

The flooding of the pond and introduction of tidal action is expected to have positive effects on the emergent plants in the pond, increasing potential nesting habitat for the species. Over time, as the pond accretes sediment, these emergent species would give way to higher marsh species such as pickleweed, decreasing nesting habitat.

3.3.2.6 Suisun song sparrow *Melospiza melodia maxillaris*

Affected Environment

In 1987 the U.S. Fish and Wildlife Service received a petition to list the Suisun song sparrow as endangered. That request was deemed unwarranted, and threatened status was considered more appropriate. The Suisun song sparrow is currently a federal and state species of concern. The Suisun song sparrow is commonly seen foraging or roosting in the shrubs along the levees within Suisun Marsh. Suisun song sparrow use of habitat adjacent to the action area for breeding is unknown. The species typically prefers thick emergent vegetation on slough or bay margins for nesting so it is likely that it utilizes areas near the action area for nesting.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. Terrestrial habitat would continue to be managed for waterfowl, as in the past. There would be no change or impact to habitat conditions or amounts.

Environmental Consequences of the Proposed Action

Direct Effects

The pond was flooded in December 2005, which negatively impacted any habitat occupied by Suisun song sparrow, because this species feeds on the ground. Because feeding areas have decreased, it is possible that fewer Suisun song sparrows would now inhabit or nest within the pond. It is expected that water level changes brought about by breaching the levee would have no additional effects on Suisun song sparrows. The levee breach would be constructed in late summer or fall, after the nesting season, so construction equipment and related activities would not impact the reproduction of the species.

Indirect Effects

Over time, as the pond accretes sediment, water levels would decrease, high and mid marsh would develop increasing habitat for Suisun song sparrows.

3.3.3 Wetland Plant Communities and Special Status Plants

Affected Environment

The Department of Fish and Game, Wildlife Habitat Division conducted a comprehensive vegetation survey of Suisun Marsh in 1999. Change detection surveys were conducted in 2000 and 2003. A map representing vegetation conditions in June 2003 is presented as Figure 7 in the Appendix A. Vegetation (prior to inundation of the property) in the wetland consists primarily of tules (*Shoenoplectus acutus*), cattails (*Typha*) and saltgrass (*Distichlis spicata*), with some waterfowl food plants such as brass buttons (*Cotula coronopifolia*) and alkali bulrush (*Bolboschoenus maritimus*). Currently, vegetation visible in the inundated pond is primarily tules, cattails and *phragmites*.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breach and would continue to manage the property as a seasonal marsh. Therefore, changes to vegetation would be minimal and remain similar to the current conditions.

Environmental Consequences of the Proposed Action

Breaching the levees would initially change the site from seasonal wetlands to open water habitat with tidal marsh vegetation establishing in the shallow areas. As sedimentation accumulates in the site, elevation would increase and tidal marsh vegetation would become established. Tidal marsh vegetation is expected to be similar to existing tidal marshes, and could include middle brackish marsh zone dominated by saltgrass (*Distichlis spicata*). Other native species dominant or co-dominant on brackish marsh plains include pickleweed (*Salicornia virginica*), fat-hen (*Atriplex triangularis*), alkali heath (*Frankenia salina*) and Baltic rush (*Juncus balticus*). In wet years, Olney's bulrush (*Scirpus americanus*) and Alkali bulrush (*S. maritimus*) are common in depressions in the middle marsh plain. There would be no net loss of wetlands, since there would be a change from seasonal wetlands to tidal marsh.

3.3.3.1 Mason's lilaepsis *Lilaepsis masonii*

Affected Environment

Mason's lilaepsis is classified as a Category 2 candidate species, and is listed as rare under the California Endangered Species Act. Mason's lilaepsis is found in the intertidal zone of freshwater and brackish marshes of the San Francisco Estuary and Delta. Mason's lilaepsis habitat is restricted to the littoral zone of freshwater and brackish marshes. It is most common on actively eroding slough banks, wave cut beaches, or earthen levees with

a clay substrate. The habitat of Mason's lilaepsis is transient and varies as a function of bank stability and changing water salinity. This species could potentially be found within the project action area, however the preferred breach locations are not actively eroding slough banks. An additional pre-project survey would be conducted and any potentially affected populations would be flagged and avoided.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and there would be no disturbance to wetland communities including Mason's lilaepsis.

Environmental Consequences of the Proposed Action

Surveys for Mason's lilaepsis would be conducted prior to construction although this species is not expected to be found at the preferred breach locations since they are not actively eroding slough banks. If this species is found, DWR would immediately consult with DFG and shift breach locations to avoid the species if possible.

3.3.3.2 Suisun marsh aster *Aster lentus*

Affected Environment

Suisun Marsh aster is a Category 2 candidate species for federal listing. The plant has no State status. USFWS uses the name *Aster chilensis* var. *lentus* for this species. Suisun Marsh aster is widely distributed throughout Suisun Marsh. It occurs along brackish sloughs and riverbanks influenced by tidal fluctuation. The species is most commonly found at or near the water's edge on the water side of Delta and Suisun Marsh levees.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to wetland communities including Suisun Marsh Aster.

Environmental Consequences of the Proposed Action

Field personnel have been directed to avoid areas where Suisun Marsh Aster is present or has been known to be present. An additional pre-project survey would be conducted and any potentially affected populations would be flagged. Because measures would be taken to avoid disturbance to Suisun Marsh aster habitat the project would not adversely affect the species. If pre-project surveys indicate that this species is within the breach location and cannot be avoided, DWR would immediately confer with USFWS biologists.

3.3.3.3 Delta tule-pea *Lathyrus jepsonii* var *jepsonii*

Affected Environment

Delta tule pea is classified as a Category 2 candidate species for federal protection under the Endangered Species Act. It has no State of California status. Delta tule pea occurs on Delta islands of the lower Sacramento and San Joaquin rivers, westward through Suisun Bay, Suisun Marsh, Napa River marshes, and the wetlands surrounding south San Francisco Bay. The species has been identified within or near to the study. This robust perennial occurs along sloughs, riverbanks, and levees influenced by tidal fluctuation. The Delta tule pea is often observed near the water's edge on the outboard side of slough levees. It also occupies the channel banks of undiked tidal marshes. Suisun Marsh populations are often observed partially inundated at high tide.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to wetland communities including Delta tule-pea.

Environmental Consequences of the Proposed Action

Field personnel have been directed to avoid areas containing populations of Delta-tule pea or areas where the species has been known to be present. A pre-project survey would be conducted within the action area, and any potentially affected populations would be flagged. If pre-project surveys indicate that this species is within the breach location and cannot be avoided, DWR would immediately consult with FWS biologists.

3.3.3.4 Suisun thistle

Cirsium hydrophilum var. *hydrophilum*

Affected Environment

Suisun thistle is listed as endangered under the federal ESA, and is a species of Concern in California. The thistle is endemic to Suisun Marsh. Historic regional floras and herbarium records suggest that it never occurred outside of Suisun Marsh. Suisun thistle is limited to the banks of small first order tidal channels in the upper elevational zones of natural tidal marsh habitat. It is also found along mosquito recirculation ditches in high marsh zones.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to wetland communities.

Environmental Consequences of the Proposed Action

This species is not known to occur within the action area. Project activities are therefore unlikely to disturb Suisun thistle populations.

3.3.3.5 Soft bird's beak

Cordylanthus mollis mollis

Affected Environment

Soft bird's beak is listed as Endangered under the federal ESA, and as a rare plant under the California ESA. This rare plant is endemic to the San Francisco Estuary and its current range is restricted to occurrences within Suisun Marsh, Contra Costa shoreline tidal marshes of Suisun Bay, Napa Marsh, and west to marshes near Point Pinole. Soft bird's beak is restricted to a narrow lower high intertidal zone of fully tidal or muted tidal marsh. This species is not known to occur within the action area.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to wetland communities.

Environmental Consequences of the Proposed Action

This species is not known to occur within the action area. Project activities are therefore unlikely to disturb Soft bird's beak populations.

3.3.4 Fish and Aquatic Special-Status Species

Three locations within the property were beach seined on August 25, 2004 to evaluate pre-project fish presence and diversity within the pond. At the sites seined, water depth varied from 0.3 to 3.0 feet. Seining was done days before the culvert was re-opened following the end of the Chinook salmon closure period. Three locations were chosen for sampling according to a likelihood of catch and for their accessibility. A beach seine was used to span the channel and corral fishes present to the bank where individuals were placed into a holding bucket for identification.

Native and introduced species were captured at all three locations. Native fishes caught include tule perch (*Hysterothorax traskii traskii*), prickly sculpin (*Cottus asper*), three-spine stickleback (*Gasterosteus aculeatus*) and Sacramento blackfish (*Orthodon microlepidotus*). Black crappie (*Pomoxis nigromaculatus*), Shimofuri gobi (*Tridentiger bifasciatus*), inland silversides (*Menidia beryllina*), mosquito fish (*Gambusia affinis*), brown bullhead (*Ictalurus nebulosus*), carp (*Cyprinus carpio*) and American shad (*Alosa sapidissima*) comprise the introduced species sampled. Temperature, D.O. and E.C. were recorded prior to seining for each site. Numerous *Palaeomon* shrimp, crayfish and other invertebrates were also observed. Survey locations and detailed results are presented in Table 2 of Appendix A.

3.3.4.1 Central Valley steelhead *Oncorhynchus mykiss*

Affected Environment

The Central Valley steelhead was listed as a threatened species by NMFS on December 23, 2005. The Central Valley steelhead Evolutionarily Significant Unit (ESU) occupies the Sacramento and San Joaquin rivers and their tributaries (SEW 2001). There are two races of steelhead, winter steelhead and summer steelhead. Rivers of the Central Valley contain only winter steelhead (Moyle 2002). Winter steelhead start entering freshwater in August, with a peak in late September-October, after which they wait until flows are high enough in tributaries to enter for spawning (Moyle 2002). Spawning begins in late December and can extend into April (SEW 2001).

Adult steelhead may be expected to move past the project area from August to March. They may potentially run up into Montezuma and Nurse sloughs. During monthly sampling between 1980 and 2005 UC Davis captured 5 steelhead in the vicinity of Blacklock. All fish were adults and were captured between December and February (BDAT 2006). No steelhead were captured anywhere in the Marsh during the month of September (proposed construction period), thus it is reasonable to assume steelhead being present at the project site during September. No steelhead were observed in the Blacklock site itself during the 2004 beach seining.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to central valley steelhead.

Environmental Consequences of the Proposed Action

No steelhead were observed within Blacklock during the DWR seining in 2004. As discussed in the previous paragraph, it appears that Central Valley steelhead are not present in sloughs adjacent to the project area during September. Effects of the action may include temporary displacement of fish from preferred habitat. However, this effect is anticipated to be insignificant because it is minimal in magnitude (one tidal cycle, low volume of water exchange relative to that of Little Honker Bay) and discountable because the probability of steelhead presence is extremely low within the action area. Because project effects are expected to be insignificant and discountable, it is our determination that this project is not likely to adversely affect Central Valley steelhead.

3.3.4.2 Central Valley spring-run Chinook salmon

Oncorhynchus tshawytscha

Affected Environment

The Central Valley spring-run Chinook salmon was listed as threatened by NMFS on September 9, 1999 and by the California Fish and Game Commission on February 5, 1999. Spring-run chinook salmon are found Central Valley streams as well as other streams in Oregon, Washington and California. Adult spring run migrate through Montezuma Slough or Suisun Bay from February through June, with the peak migration occurring in May (SEW 2001). Spring-run juveniles typically occur in the Marsh over a number of months, including December through May (SEW 2001).

No Chinook salmon were captured within Blacklock during beach seining in 2004. Between 1980 and 2005, UC Davis' monthly sampling at four current, and two historical locations near Blacklock, resulted in the capture of 169 chinook salmon. Only two of the salmon were caught in Nurse Slough, with the remainder caught in Denverton slough, upstream of the project site. All of the salmon were caught between December and April. The race of salmon was not identified. In twenty-three years of sampling, no Chinook salmon have been caught in the vicinity of Blacklock during the month of September. Thus, it is reasonable to assume that Chinook salmon are not present at the breach locations in September.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to spring- run chinook salmon.

Environmental Consequences of the Proposed Action

No chinook salmon were observed within Blacklock during the DWR survey in 2004. As discussed in the previous paragraph, it appears that spring-run chinook salmon are not present in sloughs adjacent to the project area during September. Effects of the action may include temporary displacement of fish from preferred habitat. However, this effect is anticipated to be insignificant because it is minimal in magnitude (one tidal cycle, low volume of water exchange relative to that of Little Honker Bay) and discountable because the probability of spring-run chinook salmon presence is extremely low within the action area. Because project effects are expected to be insignificant and discountable, it is our determination that this project is not likely to adversely affect spring-run chinook salmon.

3.3.4.3 Winter-run chinook salmon

Oncorhynchus tshawytscha

Affected Environment

The winter-run chinook salmon was listed as endangered by the National Marine Fisheries Service on March 23, 1994 (formerly listed as threatened by NMFS) and by the California Fish and Game Commission on September 22, 1989. Winter-run spawning occurs from late-April to early-August, peaking in May and June (Moyle 2002). Winter-run fry begin out-migrating from the spawning areas in early September. Recent studies suggest that a majority of young winter-run salmon may remain in the river until February and March (Brown and Greene 1992).

No Chinook salmon were captured within Blacklock during beach seining in 2004. Between 1980 and 2005, UC Davis' monthly sampling at four current, and two historical locations near Blacklock, resulted in the capture of 169 chinook salmon. Only two of the salmon were caught in Nurse Slough, with the remainder caught in Denverton slough, upstream of the project site. All of the salmon were caught between December and April. The race of salmon was not identified. In twenty-three years of sampling, no Chinook salmon have been caught in the vicinity of Blacklock during the month of September. Thus, it is reasonable to assume that Chinook salmon are not present at the breach locations in September.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to winter run chinook salmon or winter run chinook salmon critical habitat.

Environmental Consequences of the Proposed Action on Winter-Run Chinook Salmon

No chinook salmon were observed within Blacklock during the DWR survey in 2004. As discussed in the previous paragraph, it appears that winter-run chinook salmon are not present in sloughs adjacent to the project area during September. Effects of the action may include temporary displacement of fish from preferred habitat. However, this effect is anticipated to be insignificant because it is minimal in magnitude (one tidal cycle, low volume of water exchange relative to that of Little Honker Bay) and discountable because the probability of winter-run chinook salmon presence is extremely low within the action area. Because project effects are expected to be insignificant and discountable, it is our determination that this project is not likely to adversely affect winter-run chinook salmon.

Environmental Consequences of the Proposed Action on Winter-Run Chinook Salmon Critical Habitat

No designated critical habitat of the winter-run chinook salmon would be impacted by this project.

3.3.4.4 Delta smelt *Hypomesus transpacificus*

Affected Environment

The delta smelt was listed as threatened by the U.S. Fish and Wildlife Service on March 5, 1993 and by the California Fish and Game Commission on December 9, 1993. No delta smelt were captured in Blacklock during beach seining in 2004. UC Davis conducts monthly (adult and juvenile) fish sampling throughout Suisun Marsh. Four sites are currently located in sloughs adjacent to Blacklock, two in Nurse Slough and two in Denverton Slough. Data also exists for two historical sampling sites in Montezuma Slough at the confluence with Nurse Slough. Between 1980 and 2002, 96 delta smelt were captured at the two locations. All but nine were captured between November and April, and only two were captured in September. No delta smelt were captured near Blacklock in 2003-2005. Between 1994 and 1998 larval fish were collected in April through June at the above mentioned sites. A total of 296 larval delta smelt were collected. In twenty-three years of sampling, only two delta smelt have been caught in the vicinity of Blacklock during the month of September. Thus, it is reasonable to assume that if delta smelt are present at the breach locations in September, they are in extremely low numbers, and are adult fish, more capable of responding to changing ambient conditions.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to delta smelt or delta smelt critical habitat.

Environmental Consequences of the Proposed Action on Delta Smelt

No delta smelt were observed within Blacklock during the DWR survey in 2004. As discussed in the previous paragraph, it appears that delta smelt are not present in sloughs adjacent to the project area during September. However, it is possible that delta smelt are present in extremely low numbers near the proposed action area based upon their confirmed presence in Montezuma Slough in September 1980. The proposed action may result in water with low dissolved oxygen being released into Little Honker Bay at the time of construction. Effects of the action may include temporary displacement of fish from preferred habitat. However, this effect is anticipated to be insignificant because it is minimal in magnitude (one tidal cycle, low volume of water exchange relative to that of Little Honker Bay) and discountable because the probability of delta smelt presence is extremely low within the

action area. Because project effects are expected to be insignificant and discountable, it is our determination that this project is not likely to adversely affect delta smelt.

Implementation of the proposed project may provide additional habitat for delta smelt and may result in long-term benefits to the species.

Environmental Consequences of the Proposed Action to Delta Smelt Critical Habitat

Delta smelt critical habitat encompasses the entire legal Sacramento San-Joaquin Delta, Suisun Bay, and Suisun Marsh. Construction activities may result in temporary disturbance to the critical habitat, including increased turbidity, increased noise, and reduced water quality. However, effects are anticipated to be limited to one tidal cycle. All construction activities would be limited to time periods when delta smelt larvae, juveniles, and adults are rarely present. This project would not result in permanent loss or impact to critical delta smelt habitat.

3.3.4.5 Green Sturgeon *Acipenser medirostris*

Affected Environment

The green sturgeon was listed as threatened by NMFS on April 7, 2006. The listing became effective on July 6, 2006. The green sturgeon occurs in the Pacific from the Bering Sea to Ensenada, Mexico (Moyle 2002). On the west coast of North America, it is found in the lower reaches of larger rivers, from British Columbia to the Sacramento River (Moyle 2002). The principal spawning streams are the Rogue River, Klamath River Basin and Sacramento River (NMFS 2006). No green sturgeon were caught within Blacklock during DWR's 2004 seining. Note however, that sturgeon have very low vulnerability to beach seines. Green sturgeon have been captured in low numbers in Suisun and Grizzly Bays. The U.S. Fish and Wildlife Service has been conducting juvenile Chinook salmon monitoring at Chipps Island since 1983. Over 30,000 samples have been collected at three sites near Chipps Island and only 16 green sturgeon have been captured (BDAT 2006). UC Davis sampling has captured only 3 green sturgeon in the Marsh, none of which were captured in the vicinity of Blacklock (BDAT 2006).

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to green sturgeon.

Environmental Consequences of the Proposed Action on Delta Smelt

No green sturgeon were observed within Blacklock during the DWR seining in 2004. As discussed in the affected environment, it appears that green sturgeon are not common in sloughs adjacent to the project area. Effects of the action may include temporary displacement of fish from preferred habitat. However, this effect is anticipated to be insignificant because it is minimal in magnitude (one tidal cycle, low volume of water exchange relative to that of Little Honker Bay) and discountable because the probability of green sturgeon presence is extremely low within the action area. Because project effects are expected to be insignificant and discountable, it is our determination that this project is not likely to adversely affect green sturgeon.

3.3.4.6 Northern anchovy Essential Fish Habitat *Engraulis mordax*

Affected Environment

Northern anchovy do not have status under the federal ESA. Essential fish habitat for northern anchovy is protected under the Magnuson-Stevens Fishery Management and Conservation Act. Northern anchovy are pelagic marine fish occasionally found within Suisun Marsh during pronounced salinity intrusion events during

droughts and low outflow periods. Northern anchovy are typically found in waters ranging from 12 to 21.5 degrees Centigrade. Preferred Northern anchovy habitat includes off-shore pelagic marine environments.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to northern anchovy EFH.

Environmental Consequences of the Proposed Action

The action area does not include areas of quality habitat for the Northern anchovy. Therefore, project activities would not disturb Northern anchovy essential fish habitat.

3.3.4.7 Pacific sardine Essential Fish Habitat *Sardinops sagax*

Affected Environment

Pacific sardines do not have status under the federal ESA. Essential fish habitat for Pacific sardines is protected under the Magnuson-Stevens Fishery Management and Conservation Act. Pacific sardines are pelagic marine fish occasionally found within Suisun Marsh during pronounced salinity intrusion events during droughts and low outflow periods. Sardines are typically found in waters ranging from 12 to 21.5 degrees Centigrade. Preferred Pacific sardine habitat includes off-shore pelagic marine environments.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to pacific sardine EFH.

Environmental Consequences of the Proposed Action

The action area does not include areas of quality habitat for the Pacific sardine. Therefore, project activities would not disturb Pacific sardine essential fish habitat.

3.3.4.8 Fall-run and late-fall run chinook salmon Essential Fish Habitat *Oncorhynchus tshawytscha*

Affected Environment

Fall-run and late-fall run Chinook salmon do not have status under the federal ESA. Essential Fish Habitat for fall-run and late-fall run Chinook salmon is protected under the Magnuson-Stevens Fishery Management and Conservation Act. Fall-run Chinook salmon enter fresh water in the Sacramento River and begin spawning in October. Late-fall run Chinook salmon move upstream October through February and begin spawning in January. Migrating fall-run adults could occur in the Marsh June through December, while juveniles may be present from January through July; peak occurrence is February through mid-May. Fall-run Chinook adults migrate through the Marsh between June and December using Montezuma Slough and the Sacramento River.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to fall-run and late fall run chinook salmon EFH.

Environmental Consequences of the Proposed Action

Fall-run and late-fall run Chinook salmon may be in the vicinity of the action area during construction of the levee breaches. Effects of the action may include temporary displacement of fish from preferred habitat. However, this effect is anticipated to be insignificant because it is minimal in magnitude (one tidal cycle, low

volume of water exchange relative to that of Little Honker Bay). Implementation of the proposed project may provide additional habitat for late fall run chinook salmon and may result in long-term benefits to the species.

3.3.4.9 Starry flounder Essential Fish Habitat

Platichthys stellatus

Affected Environment

Starry flounder do not have status under the federal ESA. Essential Fish Habitat for starry flounder is protected under the Magnuson-Stevens Fishery Management and Conservation Act. Starry flounder, relatively uncommon in the Delta and Suisun Marsh, are found elsewhere throughout the San Francisco Estuary. This species prefers sandy or muddy stream bottoms within the Estuary, and are most abundant in wet years with high outflows. By July and August most of the young-of-the-year have moved into areas of higher salinity (10-15 ppt), above that range normally found in Suisun Marsh.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to starry flounder EFH.

Environmental Consequences of the Proposed Action

Starry flounder is uncommon in the Marsh, and the action area does not include areas of quality habitat for therefore, the project not expected to have any effect on starry flounder EFH.

3.3.4.10 Western Pond Turtle

Clemmys marmorata

Affected Environment

The western pond turtle is designated as a species of special concern by the California Department of Fish and Game and a federal species of concern by the U. S. Fish and Wildlife Service. Western pond turtles have been observed along sloughs and waterways throughout the Suisun Marsh. In the managed wetlands Western pond turtles are seen primarily during spring drawdown, basking on pipes or debris in the larger drainage ditches (Steve Chappell, SRCD, pers. comm.). It is not known where the turtles overwinter in the marsh, where they nest, or favored habitats of hatchlings and juveniles.

During site visits by DWR biologists to the action area, adult Western pond turtles have been observed in other locations of the action area, basking in the circulation ditches.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches and therefore no disturbance to western pond turtles.

Environmental Consequences of the Proposed Action

The proposed project may cause some temporary disturbance to Western pond turtles if they are basking near the preferred breach locations. However, any disturbance would be temporary at most since turtles would move to other basking sites, or return to the original site once DWR personnel have left the area. If a western pond turtle is observed, it would be left alone to move out of the area on its own. If it doesn't move on its own, it would be relocated by a biologist at least 200 meters away from the project location. During construction there could be some temporary increase in turbidity which may affect Western pond turtles locally. Turbidity effects would be short-lived and would not have lasting effects on Western pond turtles. Restoration of this property may provide additional habitat and thus have long-term net benefits to the species.

3.3.5 Water Quality

Affected Environment

Water quality changes, specifically changes in salinity and the production of methyl mercury, resulting from tidal inundation at Blacklock are of particular interest to DWR and other agencies involved in long term planning decisions in Suisun Marsh.

DWR has installed a monitoring station (BLL) adjacent to the proposed restoration site and would continue to collect salinity and weather data. A pressure transducer is installed in the borrow ditch to measure water levels inside the property. Pre-project methyl mercury samples were collected by DFG in January 2004 following levee overtopping.

Environmental Consequences of the No Action

DWR and USBR would not construct the levee breaches. Therefore, there would be no effect to existing water quality conditions and water quality studies would not be completed.

Environmental Consequences of the Proposed Action

With implementation of the proposed action, DWR, DFG, and USGS can continue collaborating on an interdisciplinary study to characterize changes in hydrodynamics, sediment, chlorophyll, and methylmercury dynamics in the Nurse/Denverton Slough as a result of inundation of the Blacklock property. The purpose of this study is to observe changes in these quantities due to the impending levee breach at Blacklock. Dissolved oxygen, temperature, and EC would be collected within the restoration site as part of the fish monitoring program. As part of comprehensive water quality sampling program described in Appendix A, DFG is developing specific study protocol for investigating methyl mercury exports and Methyl mercury in sediments at Blacklock.

Hydrodynamic modeling conducted by DWR has suggested that breaching levees in Suisun has an effect on salinities both in Suisun Marsh and in the Sacramento San Joaquin Delta. The specific effects are dependent on the size and location of the breach and the area of inundation. Modeling of the Blacklock restoration shows changes in salinity in Montezuma Slough, both upstream and downstream of Nurse Slough. These changes were minor and are not expected to impact the ability to meet SWRCB salinity standards for Suisun Marsh. This is discussed in more detail in the "Draft Restoration Plan for the Blacklock Restoration Project" (Appendix A).

A constructed levee breach may result in water with low dissolved oxygen levels flowing into the adjacent water ways at the time of the breaches. The effects of the action are anticipated to be insignificant because they are minimal in magnitude (low volume of water exchange relative to that of Little Honker Bay) and temporary as the full exchange should be complete within one tidal cycle. The volume of water flowing out of the property is much less than that of Little Honker Bay, the receiving waters.

If an unintended levee breach occurs, the effects of this action are expected to be insignificant because an unintended levee breach is likely to be smaller (initially) and exchange less water each tidal cycle.

3.3.6 Air Quality

Affected Environment

The project area is within the Bay Area Air Quality Management District (BAAQMD). The District's jurisdiction encompasses southwestern Solano and southern Sonoma counties and all of Alameda, Contra Costa, Marin, San

Francisco, San Mateo, Santa Clara and Napa counties. All rules and regulations of the district would be followed. Air quality is generally good as the wind blows nearly every day in Suisun Marsh (Suisun- the Native American name for "west wind". BAAQMD reports for Fairfield indicate no exceedences for ozone in the past three years, 2001-2003 (BAAQMD, 1993). There are no data available from the Fairfield station on carbon monoxide, nitrogen dioxide, sulfur dioxide and particulate matter. An increase in development adjacent to Suisun Marsh, and associated vehicular traffic may affect ozone and other air quality parameters in the future.

Environmental Consequences of the No Action

DWR and USBR would not construct the levee breaches. Therefore, there would be no effect to air quality

Environmental Consequences of the Proposed Action

Implementation of the proposed project would require the use of an excavator for 2-4 days, 6 hours per day. Breaching the levees and with the use of excavators and other vehicles is expected to increase temporarily increase dust and diesel exhaust in the general area surrounding the project location. The potential impacts associated with this activity are considered substantial because of the short-term duration of the affects and the remoteness of the restoration site.

3.3.7 Cultural Resources

Affected Environment

DWR conducted a cultural resources record search at the Northwest Information Center of the California Historical Resources Information System at Sonoma State University as part of the phase I environmental site assessment in January 2003. A search of the records maintained did not identify any previously recorded cultural resources in the project area or vicinity, nor have any cultural resources studies previously been conducted in the project area. Contact with the Native American Heritage Commission and local Native American representatives failed to identify the presence of any traditional cultural properties or sacred sites within the proposed project acreage.

A cultural resources site inspection was conducted by Janis Offerman of DWR on January 4, 2005. Ms. Offerman concluded that the proposed project area does not appear sensitive for cultural resources.

Environmental Consequences of the No Action

DWR and USBR would not construct the levee breaches. Therefore, there would be no effect to cultural resources.

Environmental Consequences of the Proposed Action

Since no known artifacts and historic properties are known to be located on the Blacklock restoration site, it is unlikely that implementation of the proposed project would result in impacts to cultural resources. If artifacts are found during construction of the levee breaches, all work would cease until the objects were evaluated by qualified personnel.

3.3.8 Indian Trust Assets

Affected Environment

Indian Trust Resources (ITRs) are legal interests in property or rights held in trust by the United States for Indian Tribes or individuals. Indian reservations, rancherias, and allotments are common ITRs. Other ITRs include traditional use areas. No Indian Trust Resources have been identified at the property

Environmental Consequences of the No Action

Since there are no Indian Trust Assets in or near the Blacklock restoration site, there would be no impact to Indian Trust Assets under no action alternative.

Environmental Consequences of the Proposed Action

Since there are no Indian Trust Assets in or near the Blacklock restoration site, the proposed action would not impact Indian Trust Assets.

3.3.9 Environmental Justice

Affected Environment

Executive Order 12898 requires each Federal Agency to identify and address disproportionately high and adverse human health or environmental effects, including social and economic effects of its program, policies, and activities on minority populations and low-income populations.

Environmental Consequences of the No Action

Since under the no action alternative, DWR and USBR would not construct the levee breaches, there would be no adverse human health or environmental effects to minority or low-income populations.

Environmental Consequences of the Proposed Action

Constructing levee breaches and restoring tidal action to this location would not result in adverse human health or environmental effects to minority or low-income populations because there are no low income or minority populations in the area and there would be no adverse health effects associated with the proposed action.

3.3.10 Recreation

Affected Environment

Public access has been restricted within the project area. Vehicular access to the site requires driving through private property. DWR has an easement to access the site for scientific or management purposes, but this easement is not for public access. A private boat launch is located along Denverton Slough, north of the proposed breach location at stn 55+00. Little Honker Bay and the adjacent sloughs are used year-around for boating and fishing.

Environmental Consequences of the No Action

Under the no action alternative, DWR and USBR would not construct the levee breaches. There would be no change to the public accessibility to the action area.

Environmental Consequences of the Proposed Action

The construction of the levee breaches and the subsequent tidal marsh succession would not substantially alter public and private recreation in the area. The restoration site has not been open to hunting since it was acquired by DWR for this restoration in 2003. Waterfowl use in project site is anticipated to change, as the habitat would change from a seasonal/managed marsh to open water habitat; however, a change in waterfowl use in the Suisun marsh region is not anticipated. Boating and fishing would not be substantially altered by the project, as the sloughs and bays would remain open to the public. Construction of the levee breaches would provide access via boat to this project area. Several "No Trespassing" signs have been installed along the exterior levee to discourage the public from accessing the site by boat. Limiting public access would be more difficult to enforce

once the site is open to tidal action. However, DWR would continue to discourage public access due to liability concerns and for the protection of sensitive species. Additional "No Trespassing" signs would be installed at the breach locations.

3.3.11 Flood Control

Affected Environment

The affected environment for flood control is included in section 3.2.9.1 above.

Environmental Consequences of the No Action

Under the no action alternative, DWR would continue with the existing management strategy which includes maintaining the cross levee. Therefore, there would not be an increase in flooding potential to the adjacent private property, compared to the current conditions.

Environmental Consequences of the Proposed Action

The exterior levees at the Blacklock restoration site would be breached to allow tidal action into the site. The existing interior (1,100 feet) cross levee has been modified to by increasing the elevation to 9 feet, vegetating the levee slope, and installing brush boxes. DWR would continue to maintain the cross levee, therefore the proposed action would not increase the potential for flooding adjacent private property.

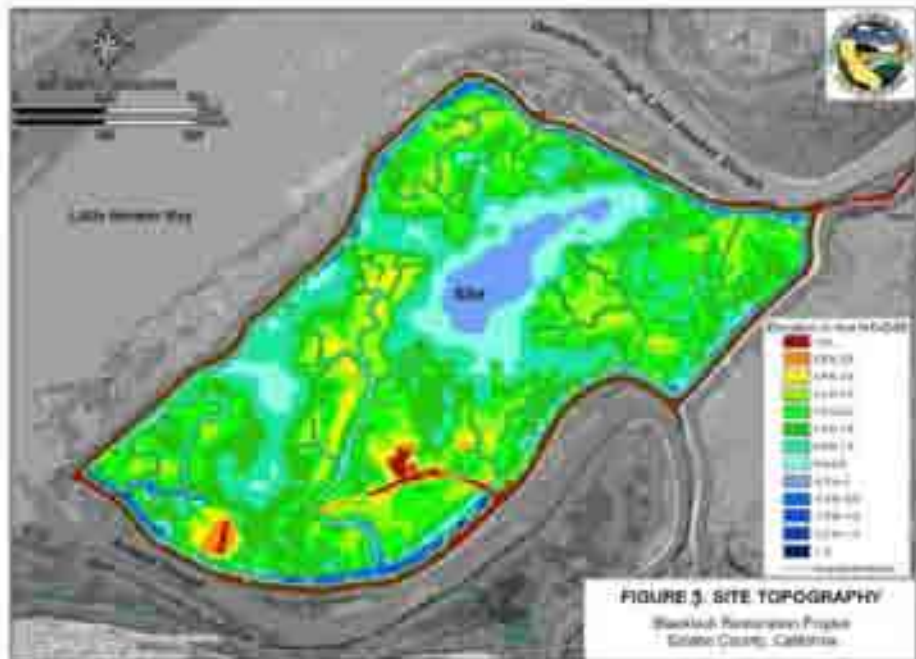


FIGURE 3. SITE TOPOGRAPHY

Blackhawk Restoration Project
 Contra Costa County, California





4.0 CUMULATIVE IMPACTS

No significant adverse cumulative impacts are expected to occur as a result of simultaneous implementation of the Blacklock Restoration Project and the projects discussed below. Positive cumulative impacts include an increase in the quantity and quality of wetland habitat and improved protection of special-status species and their habitats.

Several groups have recently recommended that some of the land in Suisun Marsh be restored to tidal action. These groups include The Goals Project and CALFED (including the Suisun Charter Group). The Recovery Plan for SMHM also recommends tidal marsh creation for the recovery of the species. In addition to the plan to restore tidal action to Blacklock, there are currently three other projects that would create tidal marsh habitat in Suisun Marsh (Montezuma Wetlands, Hill Slough West, Meins Landing)

Together, these projects are expected to create emergent, high and mid marsh habitats appropriate for native species, including listed and sensitive species. In addition to creating habitat, the areas restored to tidal marsh would experience less human disturbance than managed wetland, improving habitat value for any species occupying the restored marsh habitats.

4.1 Habitat Management, Preservation, and Restoration Plan for the Suisun Marsh

The proposed *Habitat Management, Preservation, and Restoration Plan for the Suisun Marsh* (SMP) is being developed by the Suisun Marsh Charter Group, a collaborative effort among federal, State and local agencies with primary responsibility for actions in Suisun Marsh. The Charter Group was formed in 2001 to resolve issues including, but not limited to: amending the SMPA, obtaining a Regional General Permit for maintenance activities, implementing the Suisun Marsh Levee Program, and contributing to the recovery of endangered species.

The Charter Group was charged with developing a regional plan that would outline the actions needed in Suisun Marsh to preserve and enhance managed seasonal wetlands, restore tidal marsh habitat, implement a comprehensive levee protection/improvement program, and protect ecosystem and drinking water quality. The proposed SMP would integrate implementation of the CALFED Program, Suisun Marsh Preservation Agreement, and other management and restoration programs within Suisun Marsh in a manner responsive to the concerns of stakeholders and based upon voluntary participation by private land owners. The proposed SMP also would provide for simultaneous protections and enhancement of: (1) the Pacific Flyway and existing wildlife values in managed wetlands, (2) endangered species, (3) tidal marshes and other ecosystems, and (4) water quality, including, but not limited to, the maintenance and improvement of levees.

The Charter Group initiated a formal NEPA/CEQA planning process in 2003. A series of public scoping meetings were held in November and December 2003 and a scoping report was distributed in May 2004. The Group is currently developing alternatives as part of a programmatic environmental impact report/statement. The Charter Group is integrating science throughout the planning and implementation process.

4.2 Montezuma Wetlands Project

The Montezuma Wetlands Project (MWP) plans to restore about 1,800 acres of tidal and seasonal wetlands in San Francisco Bay near the mouth of the Sacramento River using about 20 million cubic yards of non-hazardous sediment to be dredged from the shipping channels and ports in San Francisco Bay. Over several years, the site would be restored in phases, to a tidal and seasonal marsh through engineering, channeling, and contouring.

The 1,800-acre MWP site occupies the eastern side of Suisun Marsh, adjacent to Montezuma Slough between Birds Landing and Collinsville, in Solano County. The land is privately owned by Levine-Fricke Restoration Corporation and is within the jurisdiction of SRCD. Although used mostly for grazing, with some recreation and industry, about 1,500 acres of the MWP is designated for Marsh protection. The other 300 acres now designated by the BCDC for industry, would be permanently removed from potential industrial use and restored as tidal and seasonal wetlands.

Dredge material is transported to the site via barge, and then the sediment is pumped as slurry to the placement area. Once the sediment is in place, it is decanted and reshaped. Soil and water quality data indicate that MWP would not affect groundwater resources, and initial modeling results conducted by a private contractor for the environmental documentation indicate the project would not affect surface water salinity in Suisun Marsh. Proponents of the MWP claim that the project would benefit fish and wildlife resources by restoring wetland habitat and would enhance water quality, since wetlands function as a natural purification mechanism.

In December 2003 the project began to receive and place sediment. As of 2004, more than 500,000 cubic yards have been placed into Cells 1 and 2 in Phase 1. Project proponents are currently preparing additional areas of Phase I to receive an additional 1.5 million cubic yards of sediment.. Completion of the additional Phases is expected to take several years.

4.3 Hill Slough West Tidal Restoration Project

The Hill Slough West Habitat Restoration Demonstration Project would restore tidal wetlands and moist grassland (alluvial) habitat to approximately 200 acres of diked seasonal and perennial wetlands in northern Suisun Marsh, Solano County, California. The site is part of the Hill Slough Wildlife area, owned and managed by the DFG.

The Hill Slough West project site is a former tidal brackish marsh and lowland alluvial habitat along the northern margin of Suisun Marsh. The site currently supports seasonally ponded and perennial wetlands and non-native grasslands. Unscreened culverts provide limited site drainage to an adjacent tidal channel. Hardstem bulrush and cattail occur on the bayside of the outboard levee separating the project site from the adjacent slough. Areas inside the levee support a variety of wetland plants, including pickleweed, several species of bulrush, salt grass, alkali heath, and several species of rushes. The site supports limited wetland-associated wildlife such as waterfowl, wading birds, and the endangered salt marsh harvest mouse. Much of the site has subsided from historic marshplain elevations.

The wetland restoration would re-introduce tidal action to the site, restoring a transition of perennial aquatic habitat in the deepest areas, low intertidal marsh, high intertidal marsh, and lowland alluvial habitat. The desired outcome is a self-sustaining marsh ecosystem created through restoration of natural hydrologic and sedimentation processes and reliance on natural abiotic and biological succession processes.

DFG was awarded CALFED funds for restoration planning in 1998 and received subsequent funding in 2001 for the environmental documentation and permitting. Phillip Williams and Associates completed a restoration plan for the project in September, 2001. DFG is currently working on the environmental documentation and permitting for the project. The JARPA permit package has been submitted and the CEQA document is near completion. DFG hopes to implement the restoration in Summer 2007.

4.4 Meins Landing Tidal Restoration Project

The DWR, Delta Levees Branch, acquired the Meins Landing Duck Club in December 2005 and are proposing to restore the area to tidal wetlands. Meins Landing is a 668 acre managed marsh in Suisun Marsh, Solano County. DWR proposes to convert it into tidal wetlands. DWR proposes to designate some of the restoration as mitigation for impacts to the state and federally-listed endangered SMHM from DWR's proposed project to raise the levees on Van Sickle Island. Meins Landing is a mosaic of wetlands and uplands that could provide a diversity of habitats when restored. The site is currently leveed and managed as seasonally flooded wetlands used for waterfowl hunting.

The project could enhance the existing pickleweed acreage and convert some of the weedy areas into brackish and salt marsh dominated by pickle weed or other emergent species. Conversion of less desirable non native dominated sites to tidal marsh and transitional uplands would likely increase the overall value of Meins Landing for native species such as SMHM and burrowing owl.

4.5 Suisun Marsh Land Acquisition and Tidal Marsh Restoration Project

In 2003, CALFED awarded a grant of \$1,046,400 for land acquisition in Suisun Marsh. This proposal, Suisun Marsh Land Acquisition and Tidal Marsh Restoration Project, was submitted by the USFWS with collaboration with the Suisun Marsh Charter Group. DFG Central Valley Bay-Delta Branch has assumed the lead on this project.

DFG, with the assistance of an Advisory Team, is working on developing contract language, and ensuring a realistic budget for the State land acquisition process. To date, a site has not been selected for acquisition and a contract is not in place with the CDDBA.

4.6 USFWS Tidal Marsh Recovery Plan

USFWS is revising the 1984 SMHM and CCR endangered species recovery plan. The revised plan would be an ecosystem based tidal marsh recovery plan with multi-species benefits. Implementation of this plan is envisioned to facilitate recovery of SMHM, CCR, and the endangered soft bird's beak and Suisun thistle populations. This would be accomplished through the conservation, restoration, and enhancement of historic tidal marsh functions and values. The plan would in part set goals for conversion of diked managed wetlands to tidal marsh within Suisun Marsh.

5.0 MANDATORY FINDING OF SIGNIFICANCE

5.1 Proposed Action

As the analysis and discussions in Chapter 3 indicate, the Proposed Action alternative would not have the potential to substantially or significantly degrade the quality of the environment. The Environmental Checklist found in Appendix B supports this finding. The proposed actions would be authorized by Corps of Engineers, section 404 under a Nationwide Permit 24 for Restoration Activities a section 401 water quality certification would be issued by the RWQCB. Impacts to biological resources are considered to be less than significant. No new structures would be constructed. It would not eliminate important remnants of California history. Additionally, it would not contribute to significant cumulative environmental effects.

5.1.1 Mitigation Measures for any Significant Effects

As described in 5.1, there would be no significant effects on environmental resources or existing features of the human environment. To avoid potential impacts to SMHM during construction of the levee breaches, avoidance and mitigation measures have been included in the project description for implementation of this project. These measures are included as part of Proposed Action alternative to reduce the effects to a less than significant level.

5.2 No Action Alternative

Under the No Action Alternative, the proposed project would not be implemented and the levee breaches would not be constructed. Consequently, there would be no effects on the environment. No cumulative effects would be incurred from the No Action Alternative.

5.2.1 Mitigation Measures for Any Significant Effects

As discussed in section 5.2, the No Action alternative would cause no significant adverse effects on any environmental resource or existing features of the human environment. Consequently, there are no mitigation measures proposed or required under the No Action Alternative.

6.0 CONSULTATION AND COORDINATION

This draft EA/IS was prepared in consultation and coordination with applicable CEQA and NEPA requirements. The following agencies, organizations, and persons were consulted or involved in the EA/IS process:

Agency or Organization	Name
DFG	Carl Wilcox
USACE	Dave Wickens
SFRWQCB	Jolanta Uchman
USFWS	Janice Engle
NMFS	David Woodbury
NMFS	Gary Stern

Public Review

Pursuant to 40 CFR 1502.19, this draft EA/IS is being circulated to Federal, State, and local agencies that have jurisdiction by law with respect to potential effects of any alternative, and to members of the public who have been involved in this proposed action.

Endangered Species Act

Reclamation has informally consulted under Section 7 ESA with FWS and NMFS. Reclamation has received a concurrence letter from FWS that the proposed action would not likely adversely affect salt marsh harvest mouse, California clapper rail, delta smelt and delta smelt critical habitat. Reclamation has sent a letter to NMFS requesting concurrence that the proposed action would not likely adversely affect Central Valley steelhead, winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and green sturgeon.

National Historic Preservation Act

DWR and/or Reclamation will coordinate with the State Historic Preservation Office in compliance with Section 106 of the National Historic Preservation Act.

7.0 LIST OF PREPARERS

Pursuant to 40 CFR 1502.17, the names and qualifications of the people who were primarily responsible for preparing this EA/IS are presented here.

	CONTRIBUTOR	QUALIFICATIONS	YEARS OF EXPERIENCE
Terri Gaines Staff Environmental Scientist, DWR	Project Description Effects Analysis Cumulative Effects CEQA Compliance	BA Social Ecology/Environmental Planning Graduate studies in Watershed Management	18
John Robles Environmental Specialist, Reclamation	Purpose and Need NEPA Compliance	BS Conservation Biology BA Resource and Environmental Geography	18
Cassandra Enos Staff Environmental Scientist, DWR	Effects Analysis	BS, Biological Conservation MS, Water Science	15
Patty Quickert Environmental Scientist, DWR	Effects Analysis	BS Wildlife Biology	16

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