***[Note to reviewers:** This is the second draft of Chapter 4 for review by the Steering Committee. The purpose of this chapter is to describe the activities that will be addressed by the BDCP and will be proposed for regulatory coverage pursuant to the federal ESA and the state NCCPA]*

Chapter 4. Description of Covered Activities and Associated Federal Actions

4.1 Introduction

The BDCP is designed to provide the basis for regulatory coverage under the federal Endangered Species Act (ESA) and the Natural Community Conservation Planning Act (NCCPA) for a broad range of ongoing and anticipated activities that are associated with the operations of the State Water Project (SWP) and the federal Central Valley Project (CVP) in the Delta, as well as for actions related to the operation of certain power plants located in the BDCP Plan Area (refer to Figure 4.1 which identifies the Plan Area). This chapter identifies and describes the activities that are addressed by the BDCP and proposed for regulatory coverage. The chapter further categorizes these activities on the basis of the party chiefly responsible for their implementation, characterizing activities as either "covered activities" for those actions undertaken by non-federal parties or as "associated federal actions" for those actions authorized, funded, or carried out by the Bureau of Reclamation (Reclamation). The potential effects of all of these activities on covered species, their habitats, and natural communities have been evaluated as part of an overall assessment of the effects of the BDCP, as described in Chapter 4, *Effects Analysis*.

As a joint HCP/NCCP, the BDCP is intended to meet the requirements of both State and federal endangered species laws and provide the basis for non-federal entities to obtain take authorizations from the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) pursuant to section 10 of the ESA and from the California Department of Fish and Game (DFG) under section 2835 of the NCCPA, and potentially under section 2081 of the California Endangered Species Act (CESA). Specifically, the Department of Water Resources (DWR), certain SWP contractors, and Mirant Delta LLC (Mirant) are seeking regulatory coverage under the ESA and the NCCPA to ensure that their activities within the geographic scope of the Plan, including conveyance, diversions, exports, or other uses of water from the Delta and its tributaries, comply with these laws. The BDCP further provides the basis for biological assessments (BA) to facilitate consultation under Section 7 of the ESA.

[***Note to Reviewers:** The regulatory mechanism of the ESA that will be used to provide regulatory coverage to the CVP contractors has yet to be determined*]

To meet these regulatory objectives, the BDCP sets out a comprehensive conservation strategy that addresses the effects of SWP, CVP, and Mirant existing and future actions that may occur within the Plan Area on aquatic and terrestrial species, including those listed under the ESA or CESA as threatened, endangered, or candidates for listing, as well as on critical habitat, if any, that has been designated for these species (see Chapter 3 *Conservation Strategy*). The BA for federal actions in the Delta will incorporate the BDCP conservation strategy as it relates to those actions and will serve as a companion document to the BDCP. The BDCP does

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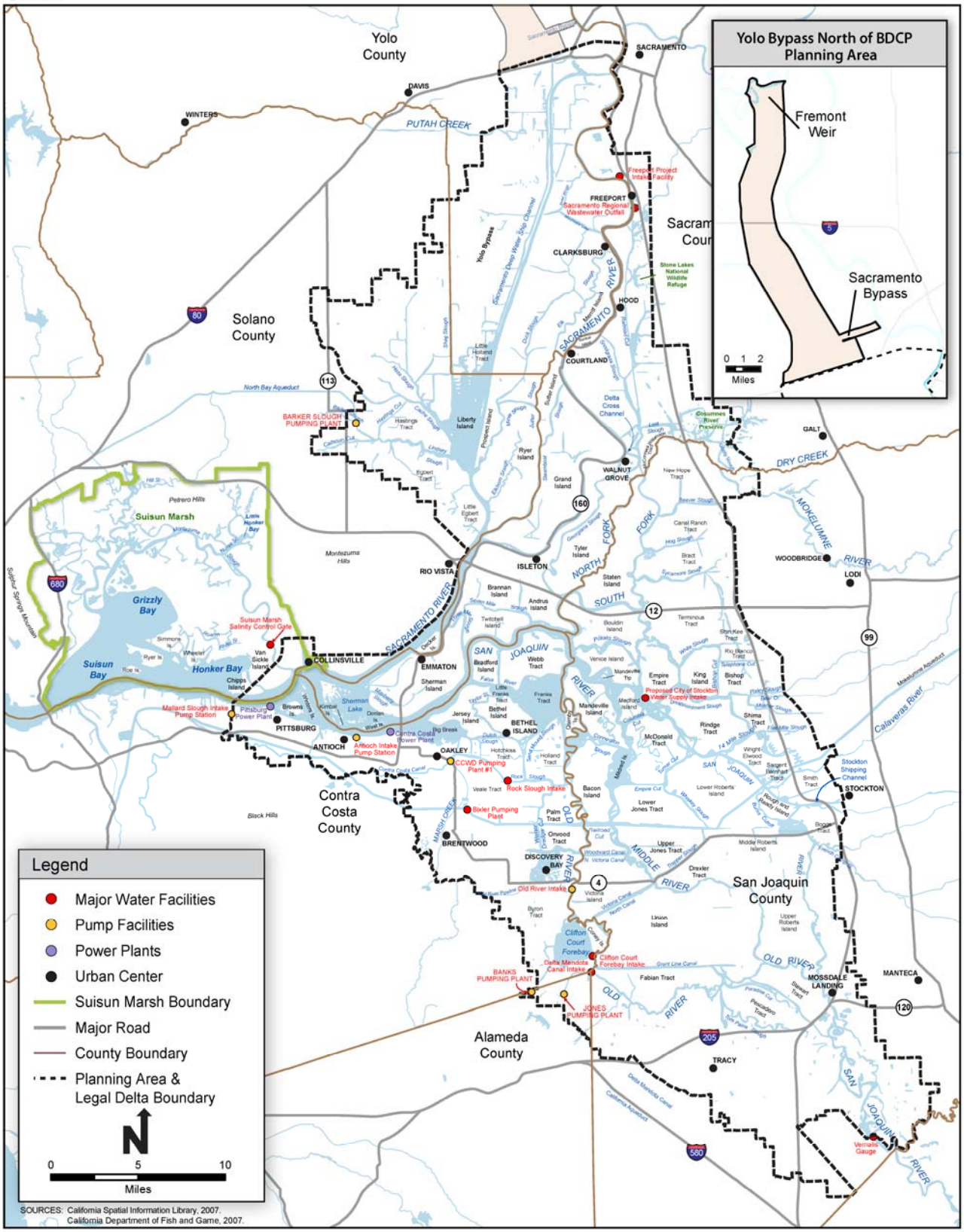

Figure 4.1 BDCP Planning Area Location

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not attempt to distinguish precisely between the effects on covered species attributable to the CVP-related federal actions and to covered activities associated with the SWP. Rather, the BDCP includes a comprehensive analysis of the effects related to both the SWP and the CVP within the Plan Area and sets out a conservation strategy that adequately addresses the totality of those effects. On the basis of the BDCP and the companion BA, it is expected that the FWS and NMFS will issue section 10 permits, and new biological opinions that supersede biological opinions existing at that time as they relate to SWP and CVP actions addressed by the BDCP, as well as upstream CVP operations.

History and Overview of the SWP and CVP

SWP

The SWP is a major inter-basin water storage and delivery system that captures and stores water in upstream reservoirs and diverts water from the south Delta. Conveyance of SWP water is via natural watercourses and canal systems to areas south and west of the Delta. After World War II, California experienced a dramatic increase in population. This population pressure strained groundwater supplies and made it clear to state and local officials that local water supplies alone would not meet future demand. The state legislature authorized an investigation of statewide water needs in 1945. DWR's predecessor, the Division of Water Resources, completed a series of studies in the 1950s that included the construction of various aqueducts and channels, a multipurpose dam and reservoir near Oroville on the Feather River, and an aqueduct to carry water from the Delta to the San Joaquin Valley and Southern California (http://www.water.ca.gov/swp/history.cfm).

In 1960, California voters authorized the first phase of the SWP to extend water deliveries from northern watersheds to Southern California cities and to farmers in the Tulare Basin that were beyond the reach of the CVP. Construction had already began in 1957 on the Oroville Dam, after a major flood two years before caused substantial damage in Northern and Central California (http://www.water.ca.gov/swp/history.cfm). After the SWP was passed by voters in 1960, the California Aqueduct, the main conveyance for the SWP, Clifton Court Forebay, and Harvey O. Banks Pumping Plant west of Tracy were constructed (see Figures 4.1 and 4.2).

The SWP is operated to provide flood control and water for agricultural, municipal, industrial, recreational, and environmental purposes. The SWP is managed to maximize the capture of water in the Delta and the usable supply released to the Delta from Oroville storage. The maximum daily pumping rate at Banks is controlled by a combination of SWRCB Water Rights Decision 1641 (D-1641), an adaptive management process, permits issued by USACE that regulate the rate of water diversion into CCF for pumping at Banks, biological opinions issued by USFWS (USFWS CVP/SWP operations 2008) and NFMS (NMFS CVP/SWP operations BO 2009), and various court rulings.

Today, the SWP includes 34 storage facilities (reservoirs and lakes), 20 pumping plants, four pumping-generating plants, five hydroelectric power plants, and about 701 miles of open canals and pipelines. It provides supplemental water to approximately 20 million Californians and about 660,000 acres of irrigated farmland (http://www.water.ca.gov/swp/).

The SWP distributes water to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California.

These suppliers, known as the State Water Project Contractors, receive specified annual amounts of water as agreed to in their contracts, which will expire in 2035. Of the contracted water supply, 70 percent goes to urban water users and 30 percent goes to agricultural users (http://www.water.ca.gov/swp/).

Not only does the SWP deliver water to two-thirds of California's population it is also operated to improve water quality in the Delta, control Feather River flood waters, provide recreation, and enhance fish and wildlife (http://www.water.ca.gov/swp/).

CVP

The CVP is a major inter-basin water storage and delivery system that captures and stores water in upstream reservoirs and diverts water from the south Delta. Conveyance of CVP water is via natural watercourses and canal systems to areas south and west of the Delta (see Figure 4.2).

Since the late 1800s, California engineers recognized the potential for moving surplus Sacramento River water from the Sacramento Valley to the drier but potentially productive San Joaquin Valley (Alexander, Mendell, and Davidson 1874). The California Department of Public Work's 1930 State Water Plan (Department of Public works 1930) concluded that upstream storage along the Sacramento River could simultaneously resolve two major water problems: water shortages in the San Joaquin Valley, where pumping in excess of natural groundwater recharge was a significant concern, and salinity intrusion in the Delta, which could be addressed by creating a hydraulic salinity barrier with controlled releases of water from upstream storage (Lund et al. 2007). This 1930 State Water Plan served as a blueprint for the eventual CVP.

The CVP was approved by the state legislature and the voters in 1933. California ceded control of the project to the federal government to maximize federal financial contributions during the hard times of the Depression. Construction of Shasta Dam, one of the primary components of the CVP began in 1938. In the 1940s, federal agencies agreed on the final form of water diversions from the Sacramento River, to divert water through the Delta via a small cross-channel. This channel was constructed by Reclamation in 1944 and named the Delta Cross Channel.

The CVP includes major upstream diversions of water from both the Sacramento and San Joaquin Rivers. Following the construction of the Friant Dam (1942) and the Friant-Kern Canal (1948), the CVP began diverting San Joaquin River water to supply irrigators on the east side of the San Joaquin Valley. Subsequent projects on the west side of the Sacramento Valley, notably the Tehama-Colusa Canal (1980), increased upstream diversions from the Sacramento River. The CVP's major water storage facilities are now at Shasta, Trinity, Folsom, and New Melones (OCAP 2008) (see Figure 4.2). Its major water pumping facility in the Delta is the Jones Pumping Plant west of Tracy.

The CVP and SWP are permitted by the State Water Resources Control Board (SWRCB) to store water during wet periods, divert water that is surplus to the Delta, and re-divert water that has been stored in upstream reservoirs (long-term CVP/SWP operations Biological Opinions). Both operate pursuant to water right permits and licenses issued by SWRCB to appropriate water by diverting to storage or by directly diverting to use and re-diverting releases from storage later in the year. The SWRCB requires the CVP and SWP to meet specific water quality, quantity, and operational criteria within the Delta.

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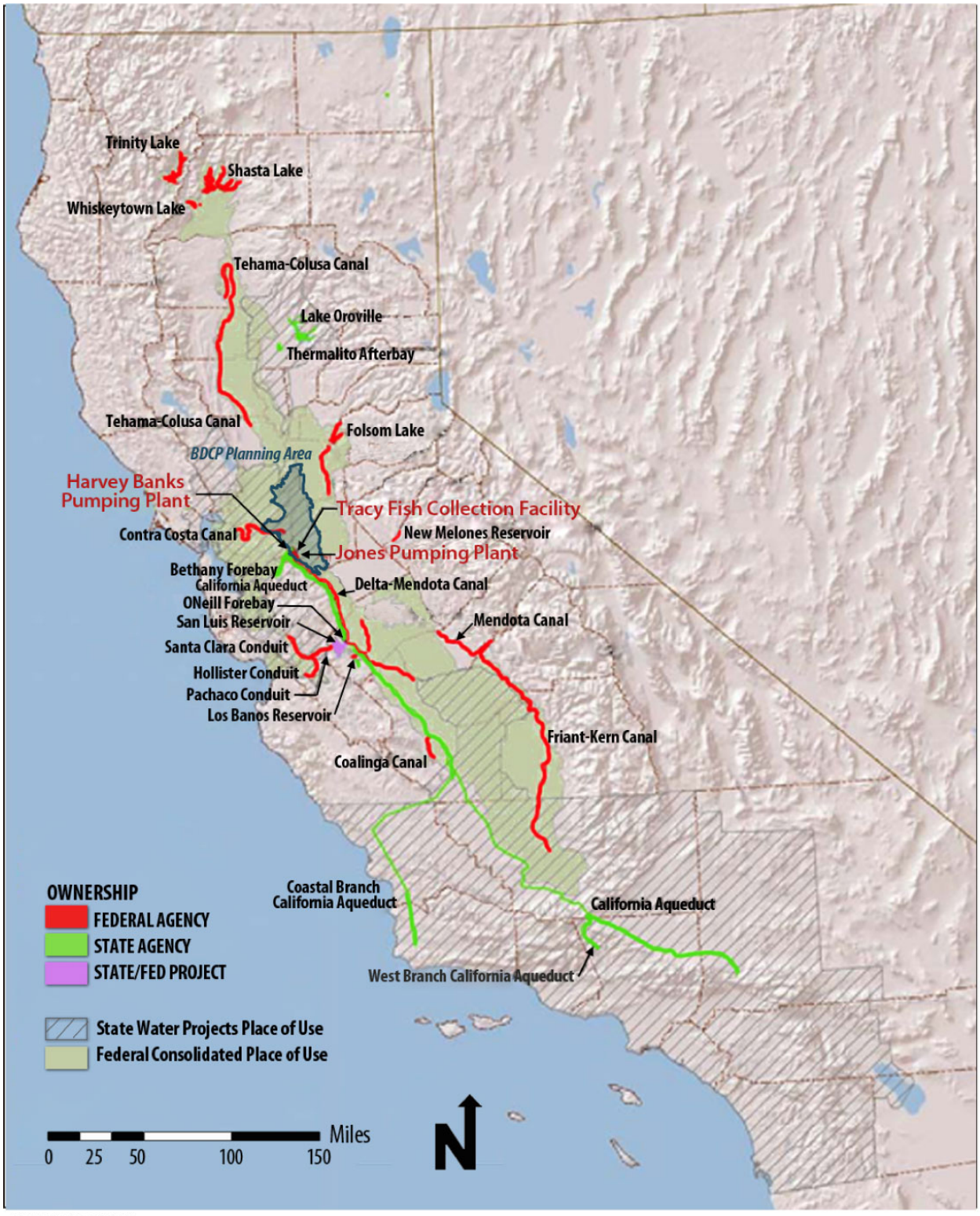

SOURCE: OCAP 2008

Figure 4.2 CVP and SWP Facilities

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The CVP presently consist of 20 dams and reservoirs, 11 powerplants, and 500 miles of major canals, as well as conduits, tunnels, and related facilities. These facilities provide enough water to irrigate approximately one-third of the agricultural land of California and furnish enough water for municipal and industrial use to supply close to 1 million households for one year (http://www.usbr.gov/projects/Project.jsp?proj_Name=Central%20Valley%20Project). The CVP has long-term contracts with more than 250 contractors in 29 out of 58 counties. (http://www.water.ca.gov/swp/cvp.cfm).

The Central Valley Project Improvement Act (CVPIA) of 1992 mandates that the CVP be partly managed for the protection, restoration, and enhancement of fish and wildlife. Water dedicated to fish and wildlife annually, a restoration fund financed by water and power users for habitat restoration and enhancement, and no new water contracts until fish and wildlife goals are achieved are among the areas of change included in the CVPIA. (http://www.usbr.gov/mp/cvpia/index.html).

Overview of Covered Activities and Associated Federal Actions

The SWP and CVP function as two inter-basin water storage and delivery systems that divert and re-divert water from the southern portion of the Sacramento-San Joaquin Delta (Delta). The SWP and CVP utilize major reservoirs upstream of the Delta to store water, and use natural watercourses and canal systems to transport water to areas south and west of the Delta. The CVP also includes facilities and operations on the Stanislaus and San Joaquin rivers, such as the New Melones and Friant Dams.

The Projects are permitted by the California State Water Resources Control Board (State Water Board) to store water during wet periods, divert water that is surplus to the Delta, and re-divert Project water that has been stored in upstream reservoirs. Both Projects operate pursuant to water right permits and licenses issued by the State Water Board that allow for the appropriation of water by diverting to storage or by directly diverting to use and re-diverting releases from storage later in the year. As conditions of their water right permits and licenses, the State Water Board requires that the CVP and SWP meet specific water quality, quantity, and operational criteria within the Delta. Reclamation and DWR closely coordinate their management of the operations of the CVP and SWP to meet these conditions.

The BDCP covered activities consist of activities in the BDCP Plan Area associated with delivering water supplies from the SWP's Delta facilities and implementing the BDCP Conservation Strategy. These activities fall into four categories: 1) operation of existing and new Delta facilities needed for water transport and delivery for Project purposes; 2) construction of new facilities; 3) maintenance, monitoring and other associated ongoing activities; and 4) implementation of certain BDCP conservation and monitoring measures.

The BDCP associated federal actions, which are authorized, funded, or carried out by Reclamation comprise those actions that occur within the BDCP Plan Area that relate to the operation of the CVP's Delta facilities to meet CVP purposes. These actions include: 1) operation of existing CVP Delta facilities to convey and export water for project purposes; and 2) associated maintenance and monitoring activities. The CVP is operated in coordination with the SWP under the Coordinated Operations Agreement (COA). As such, Reclamation and/or the CVP Contractors intend to utilize some of the conveyance capacity of a new isolated conveyance facility.

The Delta is the key conveyance hub for both the CVP and SWP systems and the water facilities (existing and proposed new facilities) in the Delta are integral to the functioning of both systems. All components of the two systems must function in synchrony or delivery of a reliable water supply and conservation of aquatic species cannot be accomplished, therefore the covered activities and associated federal actions under BDCP are crucial to support construction, operations, maintenance, and habitat conservation activities.

Under the BDCP, the implementation of covered activities and associated federal actions will occur during either the "near-term" or the "long-term." The near-term is defined as the period in which the SWP and the CVP convey water solely through existing infrastructure, in conformance with the near-term operation criteria established in this Plan. The long-term generally reflects the period in which the SWP and CVP utilizes both existing conveyance facilities and newly-constructed infrastructure (including new intakes and new conveyance pipelines) under proposed long term operation criteria that integrate existing and new facility operations.[1] The actions that will be implemented during the near-term and long-term periods will involve both covered activities and associated federal actions.

Other actions related to the CVP and SWP will occur upstream and outside of the BDCP Plan Area. For instance, DWR and Reclamation operate reservoirs and affect water deliveries in areas that are not covered by the BDCP. Although these other activities will not be covered by the BDCP, the effect of the BDCP on those activities will be analyzed and addressed in the biological opinions issued pursuant to the BDCP and in subsequent biological opinions that cover project-related activities that are outside of the BDCP Plan Area.

Mirant Delta, LLC Power Plants

The operation of Mirant Delta, LLC's power plants, which are located in the cities of Pittsburg and Antioch (referred to as the "Pittsburg Power Plant" and the "Contra Costa Power Plant"), requires the diversion of water from the Delta. Mirant's generating units burn natural gas and are cooled with Delta water. As described below, Mirant's operational parameters are set by (1) its Clean Water Act (CWA) National Pollution Discharge Elimination System (NPDES) permits, which include requirements pursuant to section 316(b); (2) incidental take permits issued by the National Marine Fisheries Service and Fish and Wildlife Service pursuant to the Endangered Species Act; and (3) a Memorandum of Understanding with the California Department of Fish and Game authorizing incidental take of species listed under the California Endangered Species Act.

Mirant's Covered Activities are those activities associated with the generation of power at its Pittsburg and Contra Costa Power Plants (together the Delta Plants). These activities can be divided into two categories: (1) current power generation activities and water intake and discharge flows associated with those activities; and (2) recurrent maintenance activities required to ensure continued operation of those existing facilities.

[1] The activities related to the development of an isolated conveyance facility are included in the long-term component of the BDCP. As such, the period associated with the long-term component of the BDCP will likely overlap with the near-term period as development of an isolated conveyance facility will occur during the implementation of the near-term operational regime.

4.2 Covered Activities

For the purpose of the BDCP, the activities described in this section are considered "covered activities" that will be implemented by non-federal entities. DWR and Mirant Delta are seeking ESA section 10 and NCCPA section 2835 permits for all covered activities described in this section.

4.2.1 Operations and Maintenance of Existing SWP Facilities

Activities associated with the operations and maintenance of existing SWP facilities include the daily operation of water diversion, conveyance, and delivery systems, and appurtenant facilities within the BDCP Plan Area. A description of these facilities is provided below. The near-term and long-term criteria and adaptive ranges set out in Chapter 3, *Conservation Strategy* establish parameters under which certain operations-related actions identified in this chapter will be carried out..

This section describes activities carried out by DWR to operate and maintain the existing SWP facilities in the Delta for which DWR is seeking take permits from FWS and NMFS pursuant to section 10 of the ESA and from DFG under section 2835 of the NCCPA. The SWP's facilities within the BDCP Plan Area consist of the Clifton Court Forebay; Banks Pumping Plant; Skinner Delta Fish Protective Facility; northern portion of the California Aqueduct; Baker Slough Pumping Plant; eastern portions of the North Bay Aqueduct (Figures 4.1 and 4.2). These SWP facilities are used to export water from the south Delta (Banks Pumping Plant) and from the north Delta (Barker Slough Pumping Plant) into canals and pipelines that carry it to municipal and industrial (M&I) and agricultural water contractors the San Francisco Bay Area and Southern California. These facilities are integral components of the SWP and contribute to the functional capacity of the overall system. This section describes these facilities, their operational requirements, and the actions necessary to maintain their viability. The operation and maintenance of these facilities are not only integral to the water supply system, but are also important to the BDCP Conservation Strategy and the protection and conservation of the aquatic ecosystem and covered fish species.

The existing SWP facilities described in this section will operate under both the near-term and long-term components of the BDCP, but will be subject to different operating criteria following completion of new water conveyance facilities (see Chapter 4 section *New Water Facilities Construction, Operation, and Maintenance*). The BDCP near- and long-term operational criteria and adaptive operational range are described in Chapter 3, *Conservation Strategy*, and include descriptions of operations of SWP facilities in the BDCP Plan Area.

The following descriptions of SWP-related covered activities are intended to be sufficiently broad to cover all aspects of the development, operation, and maintenance of identified SWP facilities that may potentially adversely affect resources covered by this Plan, including covered species and their habitats. The measures to address the effects of these covered activities on covered resources are set out in the BDCP Conservation Strategy (see Chapter 3, *Conservation Strategy*).

Clifton Court Forebay

Water for the SWP is diverted into Clifton Court Forebay (CCF) and pumped at Banks Pumping Plant (Banks). Clifton Court Forebay is a 31,000-acre-foot regulatory reservoir located in the southwestern edge of the Delta, about 10 miles northwest of the City of Tracy. Inflows to the Forebay from surrounding channels are controlled by radial gates, which are generally operated based on the tidal cycle to reduce approach velocities, prevent scour in adjacent channels, and minimize water level fluctuation in the south Delta by taking water in through the gates at times other than low tide. When a large head differential (difference in water surface elevation) exists between the outside and the inside of the gates, theoretical inflow can be as high as 15,000 cfs for a short time.

See Chapter 3, *Conservation Strategy*, for description of BDCP near- and long-term operations criteria and adaptive range for south Delta operations of the SWP and CVP to provide for protection of covered fish species in conjunction with water conveyance and diversion. DWR is seeking ESA section 10 and NCCPA section 2835 permits for all existing and future operations and maintenance of Clifton Court Forebay.

Harvey O. Banks Pumping Plant

The Banks Pumping Plant is in the south Delta, about 8 miles northwest of Tracy and marks the beginning of the California Aqueduct. By means of 11 pumps, including two rated at 375-cfs capacity, five at 1,130-cfs capacity, and four at 1,067-cfs capacity, the Banks Pumping Plant provides the initial lift of water 244 feet into the aqueduct. The nominal capacity of the Banks Pumping Plant is 10,300 cfs. The pumps can be operated at full capacity to enable diversions to utilize power in off-peak periods.

Chapter 3, Conservation Strategy, includes a description of the near-term and long-term operations criteria and adaptive ranges for south Delta operations of the SWP and CVP. These measures have been designed to address the effect on covered fish species of water conveyance and diversion actions associated with the Banks Pumping Plant. As such, the BDCP provides the basis for federal and State regulatory authorizations under the ESA and NCCPA for coverage of all existing and future operations and maintenance activities of the Banks Pumping Plant.

John E. Skinner Delta Fish Protective Facility

The John E. Skinner Delta Fish Protective Facility is located at the head of the Intake Channel that connects Clifton Court Forebay to the Banks Delta Pumping Plant. The Skinner Fish Facility screens fish away from the pumps. Large fish and debris are directed away from the pumps by a 388-foot-long trash boom. Smaller fish are diverted from the intake channel into bypasses by a series of metal louvers, while the main flow of water continues through the louvers and toward the pumps. These fish pass through a secondary system of screens and pipes into seven holding tanks, where they are later counted and recorded. The salvaged fish are then returned to the Delta in oxygenated tank trucks. See Chapter 4, *Effects Analysis*, for a description the level of take associated with of the operations of the Skinner Fish Facility. DWR is seeking ESA section 10 and NCCPA section 2835 permits for all existing and future operations and maintenance of the Skinner Fish Facility not otherwise restricted by the BDCP Conservation Strategy.

Barker Slough Pumping Plant and North Bay Aqueduct

The Barker Slough Pumping Plant diverts water from Barker Slough into the North Bay Aqueduct (NBA) for delivery in Napa and Solano Counties. The NBA intake[2] is located approximately 10 miles from the mainstem Sacramento River at the end of Barker Slough. The maximum pumping capacity is 175 cfs (pipeline capacity). During the last few years, daily pumping rates have ranged between 0 and 140 cfs. Each of the 10 NBA pump bays is individually fitted with a positive barrier fish screen consisting of a series of flat, stainless steel, wedge-wire panels with a slot width of 3/32 inch. This configuration is designed to exclude fish 25 millimeters (mm) or larger from being entrained. The bays tied to the two smaller units have an approach velocity of about 0.2 ft/sec. The larger units were designed for a 0.5-ft/sec approach velocity, but actual approach velocity is about 0.44 ft/sec. The screens are routinely cleaned to prevent excessive head loss, thereby minimizing increased localized approach velocities.

DWR is seeking ESA section 10 and NCCPA section 2835 permits for all existing and future operations and maintenance of the Barker Slough Pumping Plant not otherwise restricted by the BDCP operating criteria.

State Water Project Diversions

The amount of water delivered by the SWP in any year has been and will continue to be variable, but in any year, will be equal to the amount of water that is hydrologically available and that can be diverted under current contractual rights consistent with the terms and conditions of the BDCP and existing permits and regulations. SWP "project water" is water made available for delivery to the contractors by the project conservation and transportation facilities included in the system. Under existing contract conditions, DWR is currently (2010) obligated to make 4.167 MAF/year of water available to its contractors, except under certain conditions specified in the contract, including shortage of supply availability, under which a lesser amount may be made available. The obligation incrementally increases to a maximum amount of 4.173 MAF/year in 2021. This quantity may be exceeded if DWR determines surplus water is available above and beyond that needed to satisfy all regulations, permits, and operational requirements.

The California Water Code requires the State to allow the use of SWP facilities to convey non-Project water as long as the conveyance will not interfere with SWP operations. During dryer years, conveyance capacity is available in SWP facilities for the transfer of water by other entities. Non-Project water for Drought Water Banks, Dry Water Purchase Programs, and individual transfers has been conveyed through SWP facilities in the past and is expected to continue into the future. SWP facilities are also used to support groundwater banking programs, such as the Semitropic Water Banking and Exchange Program.

Chapter 3, Conservation Strategy, includes a description of the near-term and long-term operations criteria and adaptive ranges for the SWP and CVP under the BDCP. These measures have been designed to address the effect on covered fish species of water conveyance and diversion actions associated with the SWP and CVP. As such, the BDCP provides the basis for

[2] Solano County Water Agency is currently working with DWR to study the potential relocation of the NBA intake and, depending upon the outcome of that study, the covered activities described here may change.

federal and State regulatory authorizations under the ESA and NCCPA for coverage of all existing and future diversion activities of the SWP in the Plan Area.

Temporary Barriers in the South Delta

The South Delta Temporary Barrier Project consists of four rock barriers across south Delta channels for the purpose of benefiting San Joaquin River fall-run Chinook salmon by keeping them away from the export facilities and for the purpose of benefitting southern Delta agricultural diverters by increasing water levels, improving circulation, and improving water quality. The existing South Delta Temporary Barrier Project consists of the annual installation and removal of temporary barriers at the following locations:

- Middle River near Victoria Canal, about 0.5 mile south of the confluence of Middle River, Trapper Slough, and North Canal;
- Old River near Tracy, about 0.5 mile east of the Delta-Mendota Canal intake;
- Grant Line Canal near Tracy Boulevard Bridge, about 400 feet east of the Tracy Boulevard Bridge; and
- At the Head of Old River (in Old River near its divergence from the San Joaquin River).

These barriers will likely continue to be utilized in the near-term in conjunction with the BDCP near-term conservation measures. Long-term use of the barriers will be evaluated based on performance and need.

The barriers on Middle River, Old River near Tracy, and Grant Line Canal are tidal control facilities composed of rock and gated culverts designed to improve water levels and circulation for agricultural diversions and are in place during the growing season.

A rock barrier may be installed during the fall at the Head of Old River to improve flow quality for salmon migration in the San Joaquin River. The barrier is installed at the direction of the Department of Fish and Game. The objective of the barrier is to improve dissolved oxygen levels by reducing the amount of flow diverted into Old River and, therefore, keeping more flow moving downstream in the San Joaquin River. A non-physical or physical (rock) barrier may also be installed at the Head of Old River in the spring. This barrier would be designed to discourage salmonids migrating downstream in the San Joaquin River from entering Old River and being exposed to the effects of the export pumps. Such a barrier may utilize acoustics, light, a bubble curtain, rock, or other options to discourage fish passage.

Maintenance and Monitoring Activities

Maintenance activities consist of routine actions, including replacement of facilities, necessary to maintain the capacity and operational features of the existing water diversion and conveyance facilities, as described in this chapter, including Banks Pumping Plant, Clifton Court Forebay, Barker Slough Pumping Plant, North Bay Aqueduct, and Skinner Fish Facility. Maintenance and replacement activities include canal maintenance, placement of riprap for bankline protection and erosion control; vegetation management and weed control; operation and maintenance of electrical power supply facilities; and routine maintenance, including repair and replacement, as needed to ensure continued operations of facility or system components.

Monitoring activities for the operation of the SWP are included under BDCP Covered Activities. This includes water quality and other SWP monitoring activities. For BDCP fishery and other biological monitoring activities see section 4.2.7 *Monitoring and Research Program* below. The Department's Division of Operations and Maintenance conducts monitoring of chemical, physical and biological parameters to evaluate conditions of concern for drinking water, recreation, and fish and wildlife.

All SWP maintenance and monitoring described in this section, that could affect species or modify critical habitat protected under ESA or CESA, are covered activities and the effects of those activities are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*).

4.2.2 Power Generation Water Use - Mirant Delta, LLC

Mirant Delta's covered activities are those activities associated with the generation of power at its Pittsburg and Contra Costa Power Plants (together the Delta Plants). These activities can be divided into two categories: (1) current power generation activities and water intake and discharge flows associated with those activities; and (2) recurrent maintenance activities required to ensure continued operation of those existing facilities. The Pittsburg Power Plant is located on the southern shore of Suisun Bay near Pittsburg, California (refer to Figure 4.1), and the Contra Costa Power Plant is located 12 miles upstream on the southern bank of San Joaquin River near Antioch, California (refer to Figure 4.1).

Additionally, Mirant's operations are constrained by (1) its Clean Water Act National Pollution Discharge Elimination System (NPDES) permits and specifically by Clean Water Act section 316(b) of the federal Clean Water Act; (2) incidental take permits issued by the National Marine Fisheries Service and Fish and Wildlife Service pursuant to the Endangered Species Act; (3) a Memorandum of Understanding with the California Department of Fish and Game authorizing incidental take of species listed under the California Endangered Species Act; and (4) regulatory requirements imposed by federal and state energy agencies. These independent regulatory constraints may alter Mirant's Covered Activities for the purposes of the BDCP in both the short-term and long-term.

Existing Plants Operation

The Delta Plants have a total generating capacity of 2,090 gross megawatts (1,985 net megawatts). Mirant's generating units burn natural gas and are designed to be cooled by water from the San Joaquin-Sacramento River Delta. Cooling water is drawn into the plants through 9.5 mm (3/8 inch) screens, pumped to condensers, used to cool spent steam and then discharged immediately back into the San Joaquin-Sacramento Delta. Source waters for the Delta Plants' cooling water systems are characteristic of this part of the Bay-Delta that separates the upstream, freshwater Delta from the downstream, saltwater bays.

Pittsburg Power Plant

The Pittsburg Power Plant (PPP) consists of seven natural gas-fired generating units, four of which have been retired. PPP Units 5&6 were built in 1960 and 1961, respectively, and generate a total of 660 gross megawatts (gMW) of power. PPP Unit 7 was built in 1972 and generates 740 gMW. Cooling water for the PPP is withdrawn from Suisun Bay through two adjacent

shoreline intake structures. Units 5&6, both once-through cooled units, are each serviced by two variable frequency circulating water pumps (CWP) that withdraw water from the Units 5&6 intake structure. Each pump has a maximum design flow of 115.6 million gallons per day (MGD)(354.7 acre-feet(AF)/day) or 231.1 MGD (709.3 AF/day) per unit. The approach water velocity in front of the bar racks can range from 0.5 to around 0.2 feet per second depending on how much electric generation is needed and the number of the variable frequency pumps in operation. Unit 7, which is equipped with two mechanical-draft cooling towers and a large cooling water canal, withdraws make-up water through the Units 1-7 intake structure. Unit 7's closed-cycle system uses up to 43.6 MGD (133.9 AF/day) of make-up water.

In addition to the Units 5-7 cooling water intake requirements, the PPP withdraws water from the Units 1-4 intake structure for station water supplies, for intermittent intake screen washing, and for fire suppression purposes. At maximum operation, these additional uses account for approximately 43.6 MGD (133.7 AF/day). The total current design flow for all PPP operations is approximately 549.4 MGD (1,686.2 AF/day).

The remaining PPP units (Units 5-7, of which Units 5-6 use once-through cooling and Unit 7 uses closed-cycle cooling) are currently contracted through a tolling agreement with PG&E through the end of 2010. Over the course of 2010, Mirant Delta will determine whether the PPP units (1) will be retired, (2) continue to operate for a certain term in their existing configuration followed by retirement (as at CCPP Units 6-7 discussed below), or (3) continue to operate for a certain term with retrofits to reduce or eliminate the use of once-through cooling. Mirant Delta anticipates that, under any of these scenarios, capacity utilization at the PPP units will be consistent with the last five years of operations and will remain in the low single digits, with the units being called on to run for reliability purposes primarily in August and September.

Mirant Delta anticipates that the State Water Resources Control Board will issue its pending statewide once-through cooling policy in the second quarter of 2010, and that this policy will provide for the gradual phase-out of once-through cooled units throughout California over the next decade. Independent of ESA/CESA requirements, Mirant Delta's once-through cooled units will be required to comply with this policy.

Contra Costa Power Plant

The Contra Costa Power Plant (CCPP) consists of seven natural gas-fired generating units, five of which have been retired. Units 6&7 were built in 1964 and generate a total of 690 gMW of power. Units 6&7 are equipped with once through cooling which utilizes water withdrawn from the San Joaquin River. Units 6&7 are each serviced by two variable frequency circulating water pumps (CWP) that each have a maximum design flow of 152,800 gpm, or 220 MGD (675 AF/day). The total design flow for both Unit 6 and Unit 7 is approximately 305,600 gpm, or 440 MGD (1,351 AF/day). The approach water velocity in front of the bar racks can range from 0.6 to around 0.2 feet per second depending on much electric generation is needed and the number of the variable frequency pumps in operation.

In addition to the Unit 6 and Unit 7 cooling water intake requirements, the CCPP utilizes water for station water supplies, for intermittent intake screen washing, and for fire suppression purposes. At maximum operation, these additional uses account for approximately 22 MGD (67.5 AF/day). The total current design flow for all CCPP operations is approximately 462 MGD (1,418 AF/day).

Mirant Delta entered into a tolling agreement with PG&E in 2009 providing for the continued operation of the remaining CCPP units (Units 6-7) until April 30, 2013, at which time Mirant Delta will permanently retire CCPP Units 6-7, the only remaining once-through cooled units at the CCPP. The CCPP units are called on to operate for reliability purposes, primarily in August and September, and capacity utilization rates have been and are anticipated to continue to be in the low single digits.

Variable Frequency Drive (VFD) Circulating Water Pump Operations

The circulating water pumps at CCPP Units 6&7 and PPP Units 5-6 are mixed flow vertical centrifugal pumps equipped with A-C induction motor drives. The drives have been modified to utilize VFD controls, as well as to operate at full rated speed. The VFD controls provide a means to vary drive speed by varying frequency. For a centrifugal pump, flow is proportional to pump speed. Therefore as frequency and drive/pump speed are reduced, pump flow is also reduced proportionally (i.e., 50% pump speed => 50% pump flow).

When operating in VFD mode, the circulating water pump speed/flow is typically at its minimum level when the unit is at minimum load. The minimum circulating water pump speed/flow is limited by both the pump and motor design and the system head requirements. For PPP Units 5&6 and CCPP Units 6&7 minimum flow is 50% of design and minimum load is ~25–45 MW. As unit load increases, pump speed and flow are increased in accordance with unit conditions. Maximum circulating water speed/flow, 95–100% of design, is typically reached at ~90–145 MW for PPP Units 5&6 and CCPP Units 6&7. River water temperature, tide, condenser vacuum, steam flow, etc., all have an effect on circulating water flow requirements.

Current Actual Operational Cooling Water Flows

Actual flow rates at the Delta Plant have steadily decreased in recent years to be consistently substantially below all maximum permitted flow limits. Capacity utilization rates (the ratio between the annual net generation of power and the total net capability of the facility to generate power) at the Plants have steadily declined in recent years, and intake flows have correspondingly decreased. See Table 4.1. While the California Independent System Operator (CAISO) requires that the Delta Plants be available at any time during the year, the Delta Plants are primarily used during California's peak energy demand periods, particularly in the crucial summer months.

Table 4.1. Electrical capacity utilization and cooling water flows for CCPP and PPP from 2004 to 2008.

Plant/Year	*Capacity Utilization (MWh/(MW Capacity * hours of generation)*			*Combined Annual Cooling Water Flows (MG/yr)*	*Combined Annual Cooling Water Flows (million AF/yr)*
CCPP	**Unit 6**	**Unit 7**		**Units 6&7**	**Units 6&7**
2004	4.1	21.7		60,926	0.19
2005	1.2	10.1		29,874	0.09
2006	0.8	3.9		15,641	0.05
2007	1.4	3.3		12,879	0.04
2008	1.9	3.4		18,004	0.06
PPP	**Unit 5**	**Unit 6**	**Unit 7**	**Units 5&6**	**Units 5&6**
2004	24.0	20.8	9.5	71,751	0.22
2005	12.5	7.3	1.8	34,710	0.11
2006	7.7	5.3	1.4	25,112	0.08
2007	2.7	2.6	0.8	11,562	0.04
2008	2.3	2.4	0.8	14,859	0.05

Discharge Flows (including Stormwater)

In addition to once-through cooling flows, Mirant discharges process wastewater and stormwater (quantity and quality of discharges are subject to permits issued by the State Water Resources Control Board and San Francisco and Central Valley Regional Water Quality Control Boards).

Recurrent Plant Maintenance and Modification Activities and Monitoring Activities

Maintenance Dredging, Equipment Maintenance, Modifications and De-commissioning, and Levee and Flood Control Maintenance

Maintenance and modification activities include those routine activities that maintain the capacity and operational features of the existing power generation facilities at the Delta Plants described above. These activities include periodic maintenance dredging in front of and in the plant cooling water intake structures to remove naturally occurring accumulated sediments to ensure that the approach velocity of cooling water entering the intake structure remains relatively uniform across the intake screen and as close to design levels as possible and to prevent undue damage to the facility from sediment in the cooling water and the related abrasion and wear of power plant equipment, such as condenser tubes and circulating water pumps. Dredging is also sometimes required around the docks and in the discharge outfalls to remove the sediment build so that these structures can function and operate as designed. These activities also include recurrent equipment maintenance and modifications (such as shoreline and pier maintenance, maintenance and repair of all improvements, infrastructure, roads, electrical facilities, underground linear facilities, vegetation management, etc.), as well as modifications to existing facilities and infrastructure as needed to ensure continued power generation; levee maintenance (such as placement of riprap for shoreline protection and erosion control) as needed to protect the power generation facilities; and flood control maintenance (such as maintenance of Willow Creek at the PPP) as needed. As existing power generation units are retired, de-commissioning activities may include demolition and/or removal of improvements and fixtures as needed.

Aquatic Studies & Covered Species Monitoring

Mirant Delta is conducting, and will recurrently conduct, aquatic and covered species studies and monitoring, specifically involving data collection in the vicinity of the plants, in front of the intake and outfall structures, and within the cooling water system.

4.2.3 New Water Facilities Construction, Operations and Maintenance

Isolated Conveyance Facility Construction and Operations

DWR intends to construct new diversion and conveyance facilities designed and operated to improve protections for fish by bringing water from the Sacramento River to the existing water export pumping plants in the south Delta. This new isolated conveyance facility would allow for reductions in diversions from the existing SWP and CVP south Delta facilities and hence reduced impacts on covered fish species. The new facility will include five intake structures located on the Sacramento River between Freeport and Courtland (Figure 4-3). These intakes will be fitted with state-of-the-art positive barrier fish screens. The conveyance would consist of

Figure 4.3 – New Diversion and Conveyance Facilities (to come)

pipelines that will convey water diverted from the Sacramento River to a new regulating forebay connected to the existing Banks and Jones Pumping Facilities. The conveyance would follow an alignment generally through the central portion of the Delta to a new forebay located adjacent to and south of the existing Clifton Court Forebay. Water would be conveyed to the existing Banks and Jones pumping plants serving the SWP and CVP, respectively. The pipeline system would improve protections for water supplies from flood, earthquake, and sea level rise.

The system design would include:

- Five intake facilities with fish screens and pumping plants
- 8 miles of pipeline (23' and 33' inside diameter) to convey water from intakes to an Intermediate Forebay
- 750-acre Intermediate Forebay and an intermediate pumping plant
- 35 miles of twin pipelines (33' inside diameter each) connecting the Intermediate Forebay to the Byron Tract Forebay
- 630-acre Byron Tract Forebay
- 6 pump stations, surge towers, and gravity bypass system

Other actions necessary to support the development and operation of a new isolated conveyance facility include improvements to local drainage systems affected by the project; and other utilities improvements; any required power lines needed to operate facilities; temporary construction work sites; temporary and permanent roads; spoils disposal sites. More detail on specific features of the conveyance facility is provided in Appendix XX.

New intake and conveyance facilities specifications are summarized in Table 4.2.

Table 4.2. Summary of Conveyance Facility Physical Characteristics

Feature Description		Approximate Characteristics
Overall Project		
	Conveyance Capacity (cfs)	15,000 cfs
	Overall Length (miles)	47 miles
Intake Facilities		
	Number of In-River-Screened Intakes	5 intakes
	Flow Capacity at Each Intake (cfs)	3,000 cfs
Intake Pumping Plants		
	6 Pumps per Intake plus one spare, Capacity per Pump (cfs)	500 cfs
	Total Dynamic Head (ft)	30 to 57ft
	Total Electric Load (MW)	78 MW
Pipelines		
Pipeline #1 connecting Intake #1 to Pipeline #2, maximum flow 3,000 cfs		
	Pipeline Length (ft)	16,600 ft
	Number of Pipeline Bores; Number of Shafts (total)	1 bores; 2 shafts
	Pipeline Finished Inside Diameter (ft)	23 ft

Table 4.2. Summary of Conveyance Facility Physical Characteristics

Feature Description		Approximate Characteristics
Pipeline #2 connecting Intakes #1, 2, and 3 to Intermediate Forebay, maximum flow 9,000 cfs		
	Pipeline Length (ft)	26,150 ft
	Number of Pipeline Bores; Number of Shafts (total)	1 bores; 2 shafts
	Pipeline Finished Inside Diameter (ft)	33 ft
Pipeline #3 connecting Intermediate Pumping Plant to Byron Tract Forebay, maximum flow 15,000 cfs		
	Pipeline Length (ft)	185,000 ft
	Number of Pipeline Bores; Number of Shafts (total)	2 bores; 14 shafts
	Pipeline Finished Inside Diameter (ft)	33 ft
Intermediate Forebay		
	Water Surface Area (acres)	750 acres
	Active Storage Volume (AF)	5,250 AF
Intermediate Pumping Plant		
In Reach 2, at southern end of Intermediate Forebay		
	Number of Pumps, Capacity per Pump (cfs)	10 at 1,500 (high head) 6 at 1,500 (low head)
	Total Dynamic Head (ft)	0 to 90 ft
	Total Electric Load (MW)	142 MW
Byron Tract Forebay		
	Water Surface Area (acres)	630 acres
	Active Storage Volume (AF)	4,300 AF
Power Requirements		
	Total Conveyance Electric Load (MW)	230 MW

Chapter 3, Conservation Strategy, includes a description of the long-term operations criteria and adaptive ranges for SWP and CVP with dual operations, including the new intakes and pipeline facilities. These measures have been designed to address the effect on covered fish species of water conveyance and diversion actions associated with the new intakes and pipeline facilities. As such, the BDCP provides the basis for federal and State regulatory authorizations under the ESA and NCCPA for coverage of future construction operations of the new intakes and pipeline facilities.

Intake, Screen, and Pipeline Facilities Maintenance Activities

*[**Note to reviewers**: Maintenance requirements have not yet been finalized.]*

The proposed intake facilities will require routine or periodic adjustment and tuning to ensure operations are managed consistent with design intentions. Facility maintenance includes activities such as painting, cleaning, repairs, and other routine tasks that ensure the facilities are operated in accordance with design standards after construction and commissioning. Activities

will involve performing routine, preventive, predictive, scheduled, and unscheduled maintenance aimed at preventing equipment/facility failure or deterioration.

Continuous general inspections will be important for monitoring and logging performance; recording the history of facility conditions and deterioration, and preventing mechanical and structural failures of project elements. Sediment removal will be carried out through suction dredging, mechanical excavation, and dewatering to remove sediment buildup. If large debris is found to have accumulated around intakes, removal would require underwater diving crews, boom trucks or rubber wheel cranes, and possibly a small barge and crew to rig the leads to the debris. While cleaning frequency will need to be varied for screen operations commensurate with debris load conditions in the river, the continuous traveling brush mechanisms, or other screen cleaning technology applied, are expected to maintain a relatively clean screen face and adequate open area. Over time, biofouling can occlude the screens and jeopardize function. The key design provision for intake facilities is that all mechanical elements can be removable from the top surface for convenience of inspection, cleaning, and repairs, as needed. The intakes will feature top-side gantry crane systems for removal and insertion of screen panels, louver assemblies, and bulkheads. It is expected that all panels will require annual removal (at a minimum) for pressure washing. Additionally, individual intake bays will require dewatering (one pair at a time) for inspection and assessment of biofoul growth rates. Dewatering is accomplished by closing off portals with pre-fabricated bulkheads. Metalwork in intakes is expected to consist of plastics and austenitic steels (stainless); therefore corrosion is not expected to be detrimental to the life of the facilities. Maintenance associated with these systems consists of replacing sacrificial (zinc) anodes at multi-year intervals.

Impact damage incurred by the intake facilities (such as boat collisions, debris impact, stone and sediment abrasion, etc.) may require repairs.

The only systems associated with the intakes involving power-driven and routinely moving parts are the screen cleaning systems and gantry crane hoist systems. Lubrication of bearings, continuity checks of limit/torque switches, and periodic inspections of equipment per manufacturer recommendations are the primary O&M tasks expected for these systems. Strip brushes for the screen cleaning systems will need replacement every several years.

Maintenance would be needed for the intake pumping plants, sedimentation basins, and solids lagoons. This includes service based on a schedule recommended by the manufacturers, mussel and solids removal, and checking and replacing worn parts. Major equipment repairs and overhauls will be conducted at a centralized maintenance shop. Routine site maintenance would include landscape maintenance, trash collection, and outdoor lighting repair or replacement.

Some of the critical considerations in terms of pipeline maintenance will include evaluating whether the pipelines need to be taken out of service for inspection and, if so, how frequently this will be required. Typically, new water conveyance pipelines are inspected at least every 10 years for the first 50 years and more frequently after 50 years old.

Forebay maintenance considerations would include regular harvesting of pond weed to maintain flow and forebay capacity, the installation of automatic trash raking equipment and disposal facilities, and potential sediment dredging approximately every 50 years. Maintenance requirements for the forebay embankments would include control of vegetation and rodents, embankment repairs in the event of island flooding and wind wave action, and monitoring of

seepage flows. Maintenance requirements for the spillway would include the removal and disposal of any debris blocking the outlet culverts. Debris in the stilling basin would also have to be removed to ensure normal water flow through outlet culverts.

All maintenance of the new intakes, screens, pumps, and conveyance facilities described in this section are covered activities and the effects of those activities are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*). DWR is seeking ESA section 10 and NCCPA section 2835 permits for all maintenance of these new facilities not otherwise restricted by the BDCP Conservation Strategy.

In-Delta Conveyance Improvements

***[Note to reviewers:** The Two-Gates Demonstration Project is under consideration and will be addressed under a separate regulatory process from BDCP. If this project is carried forward by DWR, it operations will be included in BDCP covered activities. This activity is described in the Joint Federal and Non-federal Actions section herein in the event that the project is a joint Reclamation and DWR project.]*

Fremont Weir and Yolo Bypass Improvements

The purpose of this activity is to modify the Fremont Weir and Yolo Bypass and operate the Fremont Weir to increase the availability of floodplain habitat for spawning and rearing for covered species, increase food production on and downstream of the Yolo Bypass, and improve fish passage in and near the Yolo Bypass. The Fremont Weir and Yolo Bypass will be physically modified and operated to: (1) improve rearing and spawning habitat for covered fish species, (2) provide for a higher frequency and duration of inundation of the Yolo Bypass and (3) improve fish passage in the Yolo Bypass, Putah Creek, and past the Fremont and Sacramento weirs.

There are nine specific physical modifications aimed at achieving these purposes (additional details may be found in Chapter 3):

1. Creating a notch and a connecting channel to reduce Fremont Weir elevation; including new operable gates on the Fremont Weir that will allow for the control of the timing, duration, and frequency of inundation of the Yolo Bypass during non-flood stage periods of the Sacramento River;
2. Creating a Deep Fish Passage Channel;
3. Modifying Yolo Bypass;
4. Replacing the Fremont Weir Fish Ladder;
5. Constructing experimental sturgeon ramps;
6. Modifying the existing Fremont Weir stilling basin;
7. Making improvements to Sacramento Weir;
8. Making improvements to Tule Canal/Toe Drain (this includes redesigning Lisbon Weir to improve fish passage while maintaining or improving water capture efficiency for irrigation); and

9. Making improvements to Lower Putah Creek (Lower Putah Creek will be realigned to improve upstream and downstream passage of Chinook salmon and steelhead in Putah Creek and floodplain habitat will be restored to provide benefits of seasonal floodplain habitat).

All construction, maintenance, replacement, and operations of the facilities described in this section are covered activities. All required powerlines needed to operate facilities are also covered activities.

The operations of the new Fremont Weir gates under the near- and long-term criteria and adaptive range as described in Chapter 3, *Conservation Strategy*, are covered activities.

North Bay Aqueduct Alternative Intake Project

*[**Note to reviewers**: The North Bay Aqueduct Intake Relocation Project is under consideration as a covered activity pending additional information regarding how it would integrate with BDCP proposed operations and facilities under analysis.]*

The North Bay Aqueduct Alternative Intake project would include a new intake location that exports from the Sacramento River or that draws from the proposed BDCP North Delta facilities and would be designed to accommodate the projected future peak demand of up to 240 cfs.

The operations under the long-term criteria and adaptive range as described in Chapter 3, *Conservation Strategy*, are covered activities.

4.2.4 Habitat Restoration, Enhancement, and Management Activities

Habitat restoration, enhancement, and management activities include all actions that may be undertaken to implement the physical habitat conservation measures described in Section 3.4.2, *Physical Habitat Conservation Measures*. Types of actions necessary to implement habitat restoration and enhancement conservation measures are anticipated to include, but are not limited to:

- Grading, excavation, and placement of fill material;
- Breaching, modification, or removal of existing levees and dikes and construction of new levees and dikes;
- Modification, demolition, and removal of existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure);
- Construction of new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure);
- Removal of existing vegetation and planting/seeding of vegetation;
- Controlling the establishment of non-native vegetation to encourage the establishment of target native plant species; and
- Control of non-native predator and competitor species (e.g., feral cats, rats, and non-native foxes)

Habitat management actions include all activities undertaken to maintain the intended functions of protected, restored, and enhanced habitats over the term of the BDCP. Habitat management actions are anticipated to include, but are not limited to:

- Minor grading, excavation, and filling to maintain infrastructure and habitat functions (e.g., levee and dike maintenance; grading or placement of fill to eliminate fish stranding locations);
- Maintenance of infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure, fences);
- Maintaining vegetation and vegetation structure (e.g., grazing, mowing, burning, trimming); and
- Ongoing control of terrestrial and aquatic non-native plant and wildlife species.

The scope of the physical habitat actions provided for under the BDCP is presented in Table 4.3. The extent of the habitat and natural communities conservation actions set out in this section reflects both an assessment of the long-term conservation needs of individual covered species (i.e., habitat function, quantity, connectivity, and distribution), and an analysis of existing and future constraints that could affect habitat conservation, including land surface subsidence, habitat values, and land use.

A primary conservation goal of the BDCP is to restore 80,000 acres of tidal habitat, riparian habitat, and new floodplain for the benefit of fish, wildlife, and plants and ecosystem processes in the Delta and Suisun Marsh. The BDCP physical habitat conservation program is organized geographically across the northern, eastern, southern and western regions of the Delta. It is also organized by habitat type, and temporally into near-term and a long-term implementation phases. The schedule for protection, enhancement, and restoration of physical habitat is described in Chapter 6, *Implementation Plan*. Protection, enhancement, and restoration of other natural communities and habitats would be undertaken in both the near-term and long-term implementation periods as described in Chapter 6, *Implementation Plan*. In the near-term, prior to completion of the isolated conveyance facility, the BDCP targets for habitat restoration include 14,000 acres of tidal habitat and 1,300 acres of riparian forest and scrub habitat. Within 15 years, the goal is for tidal habitat restoration to reach 25,000 acres and riparian restoration to reach 2,300 acres and the addition of 1,000 acres of new seasonally inundated floodplain habitat. By year 40, the BDCP goal is to have established 65,000 acres of tidal habitat, 5,000[3] acres of riparian habitat, and 10,000 acres of new seasonally inundated floodplain.[4]

Table 4.3. Extent of BDCP Natural Communities and Habitat Types Conserved Over the Term of the BDCP[1]

Conserved Natural Community/Habitat Type	*Extent of Each Natural Community and Habitat Type Conserved*			
	Protected[2]	**Enhanced[2] (acres except as noted in table)**	**Restored**	**Total**
Seasonally Inundated Floodplain	0	2,000-6,000 cfs[3]	10,000	2,000-6,000 cfs[3] and 10,000
Freshwater Tidal Habitat and Brackish Tidal Habitat	0	0	65,000	65,000

[3] Portions of the 5,000 acres of riparian would be included within the 10,000 acres of floodplain and 65,000 acres of tidal habitat.

[4] The 10,000 acre target for new floodplain restoration does not include floodplain habitat enhanced in the Yolo Bypass under a separate conservation measure.

Table 4.3. Extent of BDCP Natural Communities and Habitat Types Conserved Over the Term of the BDCP[1]

Conserved Natural Community/Habitat Type	*Extent of Each Natural Community and Habitat Type Conserved*			
	Protected[2]	**Enhanced[2] (acres except as noted in table)**	**Restored**	**Total**
Channel Margin	0	20 linear miles	0	20 linear miles
Riparian	0[4]	0	5,000	5,000
Grassland	8,000[4]	0	2,000[5]	8,000[5]
Nontidal Permanent Emergent Marsh and Nontidal Perennial Aquatic	0[4]	0	400	400
Alkali Seasonal Wetland Complex	400	0	0	400
Vernal Pool Complex	300	0	200	500
Natural Seasonal Wetland	0	0	0	0
Inland Dune Scrub	[To be determined.]	[To be determined.]	[To be determined.]	[To be determined.]
Managed Seasonal Wetland	0	Up to 2,000	Up to 5,000	Up to 7,000
Agricultural	16,620-32,640	0	0	16,620-32,640
Total	Up to 26,320-40,340	2,000-6,000 cfs[2], 20 linear miles, and up to 2,000	Up to 75,400	2,000-6,000 cfs[3] and up to 101,720-115,740

Notes:

1. Current acreages for Effects Analysis purposes; subject to change based on results of Effects Analysis.
2. Though not included in the *Enhanced* column, all protected natural communities/habitat types will also be managed to maintain or increase their habitat functions for covered species.
3. This represents the extent of increased inflow into the existing Yolo Bypass floodplain that would be provided with operation of a modified Fremont Weir to increase the duration and frequency of seasonally inundated floodplain habitat. The conditions under which this increased inflow would be provided are described in conservation measure *CM14. Fremont Weir/Yolo Bypass Habitat Improvements* in Section 3.4.14.
4. Though not included in the *Protected* column, an undefined extent of these natural communities/habitat types are likely to be protected in small patches where they occur within larger patches of other protected natural communities/habitat types (e.g., existing patches of riparian habitat within preserved agricultural lands would be protected).
5. The 2,000 acres of restored grassland is anticipated to be restored within the transitional upland component of restored tidal habitat or in existing agricultural habitats indicated for those communities and thus do not contribute to the total land base shown in the *Total* column.

In the near-term BDCP implementation period, actions to restore tidal habitat and riparian habitats will likely be directed at the Cache Slough, West Delta, and Suisun Marsh Restoration Opportunity Areas (ROAs) (see Figure 3.1). The initial focus on these ROAs reflects the anticipated productivity benefits that may be achieved in the near-term prior to changes to the existing through Delta conveyance system. These near-term elements of the habitat program will parallel adjustments in water management and flow regimes that are designed together to realize substantial improvements in aquatic productivity and function for covered species while the structural long-term improvements are constructed. Following commencement of dual water conveyance operations (i.e., the long-term BDCP implementation period), restoration of tidal and riparian habitat would continue in these ROAs and would be expanded significantly into the remaining ROAs in the south and eastern Delta. The restoration of physical habitat in tidal and floodplain areas will not only benefit covered species by the expansion of rearing and spawning habitat, but will also improve adjacent aquatic habitat through inputs of organic material and nutrients and through influences on hydrodynamics of flow and tidal action in upstream and downstream channels.

4.2.5 Activities to Reduce Contaminants

Activities to reduce contaminants that could result in incidental take may include the action listed below. A more detailed discussion of this action is provided in Chapter 3.

- Control of Methylmercury Load in BDCP Restoration Sites - The purpose of this measure is to minimize the methylation of inorganic mercury in BDCP restoration areas caused by BDCP restoration actions. The BDCP Management Entity will minimize to the extent practicable any increase in mercury methylation associated with habitat restoration conservation measures through the design and implementation of restoration projects. The BDCP Management Entity will work with DWR and the Central Valley Regional Water Quality Control Board (CVRWQCB) to identify and implement methods for minimizing the methylation of mercury in BDCP restoration areas.

4.2.6 Activities to Reduce Predators and Other Sources of Direct Mortality

Activities to reduce predators and other sources of direct mortality that could result in incidental take may include such actions as those described below. A more detailed discussion of these actions is provided in Chapter 3.

- Reduce Effects of Predators - Reduce local effects of predators on covered fish species by conducting focused predator control in high predator density locations. The BDCP Management Entity will reduce the local effects of predators on covered fish species by conducting focused predator control using a variety of methods in locations in the Delta that are known to have high densities of predators ("predator hot spots").
- Non-physical Barriers - The purpose of this conservation measure is to improve the survival of outmigrating juvenile salmonids by using non-physical barriers to re-direct them away from channels in which survival is lower. The BDCP Management Entity will install non-physical barriers at the junction of channels with low survival of outmigrating juvenile salmonids to deter fish from entering these channels.
- Control Non-Native Submerged and Floating Aquatic Vegetation in BDCP Tidal Habitat Restoration Areas - The BDCP Management Entity will control Brazilian waterweed (*Egeria densa*), water hyacinth (*Eichhornia crassipes*), and other non-native submerged and floating aquatic vegetation (SAV and FAV) in BDCP tidal habitat restoration areas.

4.2.7 Monitoring and Research Programs

As described in Chapter 3, various types of monitoring activities will be conducted during BDCP implementation including preconstruction surveys, construction monitoring, compliance monitoring, effectiveness monitoring, and system monitoring. In addition, focused research will be undertaken or contracted to develop information necessary to better inform BDCP implementation. Such monitoring and research activities could result in incidental take. Though individual instances of take are expected to be minor, there are likely to be many such instances over a long period of time.

4.2.8 Other Conservation Actions

All other conservation actions, included in BDCP Chapter 3 *Conservation Strategy* that could result in incidental take, not described above are covered activities. Although take levels are expected to be low, other conservation actions that could result in take of covered species and therefore require authorization as covered activities are included. Examples of actions include:

- Dissolved Oxygen - The purpose of this conservation measure is to maintain dissolved oxygen concentrations above levels that impair covered fish species in the Stockton Deep Water Ship Channel during periods when covered fish species are present. The BDCP Management Entity will operate and maintain an oxygen aeration facility in the Stockton Deep Water Ship Channel to increase dissolved oxygen concentrations.
- Conservation Hatcheries - The purpose of this conservation measure is to establish new and expand existing conservation propagation programs for delta and longfin smelt. The BDCP Management Entity will support: (1) the development of a delta and longfin smelt conservation hatchery by the USFWS to house a delta smelt refugial population and provide a source of delta and longfin smelt for supplementation or reintroduction, if deemed necessary by Fishery Agencies, and (2) the expansion of the refugial population of delta smelt and establishment of a refugial population of longfin smelt at the University of California, Davis Fish Conservation and Culture Laboratory to serve as a population safeguard in case of a catastrophic event in the wild.

4.2.9 Emergency Actions

The Plan covers emergency activities related to facilities constructed and operated under the BDCP and emergency activities within BDCP habitat conservation areas necessary to prevent and minimize loss of human life, property, critical infrastructure, and sensitive natural resources. Emergency activities may occur in response to flooding, water distribution, fire, or other natural disasters and accident response. By their nature, these events cannot be planned for or directed to areas with less sensitive resources. Emergency activities may be associated with power supply, conveyance, and other infrastructure.

Emergency actions include, but are not limited to: repairs of imperiled or broken utility lines, or utility failures; repairs of structures damaged by floods where such repairs cannot be delayed due to the imminent loss of life or property; repair, replacement, and/or removal of failed structures and associated facilities; repair of structures that are in imminent danger of serious damage or failure; protection of structures and property from flooding; fire suppression; response to accidents; cleanup of tree blow downs; repair of gates; repair of levees; cleanup of spilled hazardous materials and/or waste; and emergency sedimentation and erosion control activities.

4.3 Federal Actions Associated with the BDCP

For the purpose of the BDCP, the activities described in this section are considered "federal actions associated with the BDCP," as differentiated from the "covered activities" that will be implemented by non-federal entities. The federal actions identified in this section will be authorized or carried out by Reclamation, consistent with the terms and conditions of the Plan and in coordination with DWR. Since these federal actions are subject to section 7 of the ESA,

Reclamation will consult with FWS and NMFS. The Section 7 consultation will also include other CVP operations that are not within the BDCP Plan Area, but are a necessary part of consultation on the totality of CVP operations.

CVP Operations and Maintenance

This section describes actions by Reclamation in operating and maintaining existing CVP facilities in the Delta that will be included in consultations with USFWS and NMFS pursuant to section 7 of the ESA. The BDCP provides the basis for Delta operations which will be included in a biological assessment (BA) to facilitate consultations under section 7.

The CVP's Delta Division[5] facilities within the BDCP Plan Area consist of the Delta Cross Channel (DCC); the eastern portion of the Contra Costa Canal, including the Contra Costa Water District's (CCWD) diversion facilities; the Jones Pumping Plant (formerly Tracy Pumping Plant), the Tracy Fish Collection Facility (TFCF); and the northern portion of the Delta Mendota Canal (DMC) (Figures 4.1 and 4.2). These CVP facilities are used to convey water from the Sacramento River in the north Delta to the south Delta and to export that water from the Delta into canals and pipelines that carry it to agricultural and municipal and industrial (M&I) contractors to the south and west of the Delta. These facilities are integral components of the CVP and contribute to the functional capacity of the overall system. This section describes these facilities, their operational requirements, and the actions necessary to maintain their viability. The operation and maintenance of these facilities are not only integral to the water supply system, but are also important to the BDCP Conservation Strategy and the protection and conservation of the aquatic ecosystem and covered fish species.

The existing CVP facilities described in this section would be operated under both the BDCP near-term and long-term implementation, but with differing operating criteria following completion of new facilities (see Chapter 4 section *New Facilities Construction, Operation, and Maintenance*). The BDCP near- and long-term operational criteria and adaptive operational range are described in Chapter 3, *Conservation Strategy*, and include descriptions of operations of CVP facilities in the BDCP Plan Area.

All operations and maintenance of CVP facilities described in this section are federal actions associated with the BDCP and the effects of those actions are addressed by the BDCP Conservation Strategy (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*) and will be covered in the BDCP section 7 consultation.

Delta Cross Channel

The DCC is a gated diversion channel between the Sacramento River, near Walnut Grove, and Snodgrass Slough (Figure 4.1). Flows into the DCC from the Sacramento River are controlled by two 60-foot by 30-foot radial gates. When the gates are open, water flows from the Sacramento River through the cross channel to Snodgrass Slough and from there to channels of the lower Mokelumne River and into the central Delta. Once in the central Delta, the water is conveyed

[5] The Delta Division is one of several CVP divisions covering various geographical areas and facilities of the CVP including the American River, Friant, East Side, Sacramento River, San Felipe, West San Joaquin, and Shasta/Trinity River divisions. The CVP Delta Division includes facilities within the BDCP Plan Area (described in this chapter) and facilities outside the BDCP Plan Area (not included in this chapter).

primarily via Old and Middle rivers to the Jones Pumping Plant by the draw of the pumps. The DCC operation improves water quality in the interior Delta by improving circulation patterns of good quality water from the Sacramento River towards Delta diversion facilities.

Reclamation operates the DCC in the open position to (1) improve the transfer of water from the Sacramento River to the export facilities at the SWP Banks (see description of SWP facilities) and CVP Jones Pumping Plants, (2) improve water quality in the southern Delta, and (3) reduce salt water intrusion rates in the western Delta. During the late fall, winter, and spring, the gates are often periodically closed to protect out-migrating salmonids from entering the interior Delta where they are subject to higher levels of predation and greater potential for entrainment at the CVP and SWP south Delta export facilities. When flows in the Sacramento River at Sacramento reach 20,000 to 25,000 cfs (on a sustained basis) the gates are closed to reduce potential scouring and flooding that might occur in the channels on the downstream side of the gates. See Chapter 3, *Conservation Strategy* for description of operations of the DCC gates under the BDCP to provide for protection of salmon in conjunction with water conveyance. Reclamation is seeking ESA section 7 authorization for all operations and maintenance of the DCC not otherwise restricted by the BDCP operating criteria.

C.W. Jones Pumping Plant

The CVP and SWP use the Sacramento River, San Joaquin River, and Delta channels to transport water to pumping plants located in the south Delta (Figures 4.1 and 4.2). The CVP's Jones Pumping Plant, about five miles northwest of Tracy, consists of six available pumps. The Jones Pumping Plant is located at the end of an earth-lined intake channel about 2.5 miles in length. Jones Pumping Plant has a physical capacity of 5,100 cfs and State Water Resources Control Board (Water Board) permitted diversion capacity of 4,600 cfs with maximum pumping rates typically ranging from 4,500 to 4,300 cfs during the peak of the irrigation season and approximately 4,200 cfs during the winter non-irrigation season until construction and full operation of the proposed DMC/California Aqueduct Intertie. The winter-time physical constraints on the Jones Pumping Plant operations are the result of a DMC freeboard constriction near O'Neill Forebay, O'Neill Pumping Plant capacity, and the current water demand in the upper sections of the DMC.

See Chapter 3, Conservation Strategy, for description of south Delta operations of CVP and SWP under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion. Reclamation will consult under ESA section 7 on all operations and maintenance of the Jones Pumping Facility not otherwise restricted by the BDCP operating criteria.

Tracy Fish Collection Facility

At the head of the intake channel leading to the Jones Pumping Plant, TFCF louver screens intercept fish that are then collected, held, and transported by tanker truck to Delta release sites away from the south Delta facilities. The TFCF uses behavioral barriers consisting of primary and secondary louvers to guide entrained fish into holding tanks. The primary louvers are located in the primary channel just downstream of the trashrack structure. The secondary louvers are located in the secondary channel just downstream of the traveling water screen. The louvers allow water to pass through onto the Jones Pumping Plant but the openings between the slats are

tight enough and angled against the flow of water in such a way as to prevent most fish from passing between them and instead enter one of four bypass entrances along the louver arrays. The holding tanks on hauling trucks used to transport salvaged fish to release sites are injected with oxygen and contain an eight parts per thousand salt solution to reduce stress on fish. The CVP uses two release sites, one on the Sacramento River near Horseshoe Bend and the other on the San Joaquin River immediately upstream of the Antioch Bridge. See Chapter 4, *Effects Analysis,* for a description the level of take associated with of the operations of the TFCF. Reclamation is seeking ESA section 7 authorization for all operations and maintenance of the TFCF not otherwise restricted by the BDCP operating criteria.

Contra Costa Water District Diversion Facilities

Contra Costa Water District (CCWD) diverts water from the Delta for irrigation and municipal and industrial (M&I) uses under CVP contract; under its own State Water Board permit and license at Mallard Slough; and under its own Los Vaqueros water right permit at Old River near State Route 4. CCWD's system includes intake facilities at Mallard Slough, Rock Slough (and fish screen under construction and covered by a separate ESA section 7 consultation), and Old River near State Route 4; the Contra Costa Canal and shortcut pipeline; Contra Loma Reservoir; and the Los Vaqueros Reservoir. CCWD is adding a fourth diversion point on Victoria Canal, the Alternative Intake Project, scheduled to begin operations by the spring of 2010 and covered by a separate ESA section 7 consultation. The Rock Slough intake facilities, the Contra Costa Canal, and the shortcut pipeline are owned by Reclamation, and operated and maintained by CCWD under contract with Reclamation. Mallard Slough Intake, Old River Intake and Los Vaqueros Reservoir are owned and operated by CCWD and covered under separate ESA section 7 consultation. CCWD has received take authorization for Los Vaqueros Reservoir operations (including Rock Slough, Mallard Slough, Old River and the Alternative Intake Project) under ESA section 7 Biological Opinions issued to Reclamation for that purpose; CCWD operations are also included among Reclamation's operations that are covered in the existing biological opinions on SWP/CVP operations (USFWS 2008; NMFS 2009). CCWD has California Endangered Species Act take authorization for all its operations under a 2081 permit issued by the Department of Fish and Game. Operation of the CCWD is covered in the long-term CVP/SWP operations Biological Opinions. Reclamation would include these operations in the BDCP ESA Section 7 consultation. CCWD is not an ESA section 10 permit applicant under BDCP, however, all operations and maintenance of CCWD facilities described in this section that could affect species or modify critical habitat protected under ESA, are CVP federal actions associated with the BDCP and the effects of those actions will be addressed in the BDCP section 7 consultation.

The Rock Slough Intake is located about four miles southeast of Oakley, where water flows through into the earth-lined portion of the Contra Costa Canal. This section of the canal is open to tidal influence and continues for four miles to Pumping Plant 1, which has capacity to pump up to 350 cfs into the concrete-lined portion of the canal. Prior to completion of the Los Vaqueros Project in 1997, this was CCWD's primary diversion point. Consistent with CVPIA (Central Valley Project Improvement Act) and as required by the USFWS Biological Opinion for the Los Vaqueros Project (USFWS 1993), Reclamation, in collaboration with CCWD, is in the process of constructing a fish screen at the Rock Slough intake. All of CCWD's other intakes (Mallard Slough, Old River and the Alternative Intake on Victoria Canal) are screened.

CCWD's Alternative Intake Project consists of a new 250 cfs screened intake in Victoria Canal, and a pump station and ancillary structures, utilities, and access and security features; levee improvements; and a conveyance pipeline to CCWD's existing conveyance facilities. CCWD will operate the intake and pipeline together with its existing facilities to better meet its delivered water quality goals and to better protect listed species. While operations of the Alternative Intake Project are addressed by a separate Biological Opinion, future operations and maintenance of this facility are federal actions associated with the BDCP and the effects of those actions are addressed by the BDCP Conservation Strategy and will be covered by the BDCP section 7 consultation. Reclamation will consult under ESA section 7 on all operations and maintenance of the CCWD diversion facilities not otherwise restricted by the BDCP operating criteria.

Central Valley Project Diversions

The volume of water delivered by the CVP is and will continue to be variable, but in any year will be equal to the amount of water that is hydrologically available and that can be diverted under current contractual rights consistent with the terms and conditions of the BDCP Conservation Strategy and then-existing permits and regulations. Reclamation delivers water transported through facilities in the Delta to senior water rights contractors, long-term CVP water service contractors, refuges and waterfowl areas, and temporary water service contractors south of the Delta. The total volume under contract, including Level 2 refuge supplies, is approximately 3.3 MAF. Additionally, the CVP provides Level 4 refuge water totaling approximately 100,000 AF. In addition, as part of the San Joaquin River Restoration Program implementation, Reclamation anticipates submitting a petition of permits to the State Water Board to allow re-diversion of the restoration flows either upstream of or in the Delta. Moreover, in wet hydrologic conditions when CVP storage is not available, Delta is in excess conditions, water is made available under temporary contracts for direct delivery. The volume of water available for conveyance through the Delta is a result of hydrologic conditions, upstream reservoir operations, upstream demands, regulatory constraints on CVP operations, and from transfers of water from upstream water users to south of Delta water users.

Water passing through the Delta associated with water transfers (e.g., Drought Water Bank and Dry Year Water Purchase Programs) is also a covered action.

See Chapter 3, *Conservation Strategy*, for description of near-term and long-term operations and adaptive range of CVP and SWP under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion. All CVP diversions described in this section are federal actions associated with the BDCP and the effects of those actions are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*) and will be covered in the BDCP section 7 consultation. Reclamation is seeking ESA section 7 authorization for all CVP diversions not otherwise restricted by the BDCP operating criteria.

Associated Maintenance and Monitoring Activities

Maintenance and replacement means those routine activities that maintain the capacity and operational features of the existing CVP water diversion and conveyance facilities described above including the DCC, Jones Pumping Plant, TFCF, and Contra Costa Diversion Facilities. Maintenance activities include maintenance of electrical power supply facilities; routine maintenance as needed to ensure continued operations and replacement of facility or system

components when necessary to maintain system capacity and operational capabilities; and upgrades and technological improvements of facilities to maintain system capacity and operational capabilities.

Monitoring activities refers to those actions necessary for monitoring water quality and fisheries as conditioned by water rights permits and biological opinions, those actions undertaken as a result of the CVPIA and agreements, and any additional monitoring under the BDCP as described in Chapter 3, *Conservation Strategy*, for which Reclamation is responsible. These actions include routine daily, annual or other periodic sampling of water quality constituents as well as trawls for various fish species in the Delta (including actions associated with the Interagency Ecological Program). Reclamation currently operates and maintains more than 20 monitoring stations in the Delta which provide near-realtime water quality data. As the BDCP Conservation Strategy is implemented, the nature of, and requirements for, monitoring would be expected to change.

All CVP maintenance and monitoring described in this section are federal actions associated with the BDCP and the effects of those actions are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*) and will be covered in the BDCP section 7 consultation.

4.4 Joint Federal and Non-federal Actions

This section describes actions carried out jointly between DWR and Reclamation. These actions are covered activities under ESA section 10 and NCCPA section 2835 for DWR and any other non-federal entity involved. The activities identified in this section for federal actions by Reclamation are not "covered activities" for the purposes of the ESA Section 10(a)(1)(b) permit. These federal actions are actions that occur within the Delta which will be coordinated with DWR to support DWR's compliance with the ESA Section 10 permit. Reclamation's activities are subject to ESA section 7 and Reclamation will consult under ESA section 7 on those actions. The Section 7 consultation will also include other CVP operations that are not within the BDCP Plan Area.

Joint Point of Diversion Operations

The State Water Board Decision 1641 (D-1641) (December 1999; revised March 2002) granted Reclamation and DWR the ability to use/exchange each Project's diversion capacity capabilities to enhance the beneficial uses of both Projects. This use of one Project's diversion facility by the other Project is referred to as the Joint Points of Diversion (JPOD).

In general, JPOD capabilities are used to accomplish four basic CVP-SWP objectives:

- When wintertime excess pumping capacity becomes available during Delta excess conditions and total CVP-SWP San Luis storage is not projected to fill before the spring pulse flow period, the project with the deficit in San Luis storage may elect to use JPOD capabilities.
- When summertime pumping capacity is available at Banks Pumping Plant and CVP reservoir conditions can support additional releases, the CVP may elect to use JPOD capabilities to enhance annual CVP south of Delta water supplies.

- When summertime pumping capacity is available at Banks or Jones Pumping Plant to facilitate water transfers, JPOD may be used to further facilitate the water transfer.
- During certain coordinated CVP-SWP operation scenarios for fishery entrainment management, JPOD may be used to shift CVP-SWP exports to the facility with the least fishery entrainment impact while minimizing export at the facility with the most fishery entrainment impact.

See Chapter 3, *Conservation Strategy*, for description of operations of CVP and SWP under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion. All in-Delta JPOD operations are State activities and federal actions associated with the BDCP and the effects of those activities/actions are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*) and federal actions will be covered in the BDCP section 7 consultation. DWR is seeking ESA section 10 and NCCPA section 2835 permits and Reclamation will consult under ESA section 7 on all JPOD operations not otherwise restricted by the BDCP operating criteria.

Operations of New Water Intake and Conveyance Facilities

[More text to be added]

DWR operations associated with the new water conveyance facilities in the Delta is a covered activity/action as controlled by the long-term criteria and adaptive range described in Chapter 3, *Conservation Strategy*.

Transfers

Laws established in California governing water use, as well as the provisions of the CVPIA, promote the use of water transfers to manage water resources, particularly water shortages, provided that certain conditions of transfer are imposed to protect source areas and users. Transfers requiring export from the Delta are conducted at times when pumping and conveyance capacity at the CVP or SWP export facilities is available to move the water. Additionally, operations to accomplish these transfers must be carried out in coordination with CVP and SWP operations, such that the capabilities of the Projects to exercise their own water rights or to meet their legal and regulatory requirements are not diminished or limited in any way.

CVP and SWP contractors have independently acquired water and arranged for pumping and conveyance through SWP facilities. State Water Code provisions grant other parties access to unused conveyance capacity, although SWP contractors have priority access to capacity not being used by the DWR to meet SWP contract amounts.

See Chapter 3, *Conservation Strategy*, for description of operations of CVP and SWP under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion, including water transfers. Delta water operations involving transfers are state activities and federal actions associated with the BDCP and the effects of those activities/actions are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*) and federal actions will be covered in the BDCP section 7 consultation. DWR is seeking ESA section 10 authorization and Reclamation will consult under section 7 on all water transfers through the Delta conveyance and diversion facilities not otherwise restricted by the BDCP operating criteria.

Suisun Marsh Facilities Operations and Maintenance

The existing Suisun Marsh facilities are:

- Suisun Marsh Salinity Control Gates;
- Morrow Island Distribution System;
- Roaring River Distribution System;
- Goodyear Slough Outfall; and
- Various salinity monitoring and compliance stations throughout the Marsh.

Since the early 1970's, the California Legislature, State Water Board, Reclamation, DFG, Suisun Resource Conservation District (SRCD), DWR, and other agencies have worked to preserve beneficial uses of Suisun Marsh to mitigate for potential impacts on salinity regimes associated with reduced Delta outflow. Initially, salinity standards for Suisun Marsh were set by the State Water Board's Decision 1485 to protect alkali bulrush production, a primary waterfowl plant food. Subsequent standards set under the State Water Board's D-1641 reflect the intention of the State Water Board to protect multiple beneficial uses. A contractual agreement between DWR, Reclamation, DFG and SRCD includes provision for measures to mitigate the effects of SWP and CVP operations and other upstream diversions on Suisun Marsh channel water salinity. The Suisun Marsh Preservation Agreement requires DWR and Reclamation to meet specified salinity standards, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements.

See Chapter 3, *Conservation Strategy*, for description of operations of Suisun Marsh Salinity Control Gates under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion.

Maintenance activities for existing facilities include: levee repairs, vegetation removal, fish screen cleaning or installation of new screens, mechanical repairs, structural repairs, removal or replacement of monitoring and compliance stations (can involve in-water work) and instrumentation installation on or near existing facilities.

Operations and maintenance of Suisun Marsh facilities are state activities and federal actions associated with the BDCP and the effects of those activities/actions are addressed by the BDCP (see Chapter 3, *Conservation Strategy* and Chapter 4, *Effects Analysis*) and federal actions will be covered in the BDCP section 7 consultation. DWR and Reclamation are seeking ESA section 10 and Reclamation will consult under section 7 on all operations and maintenance of all facilities in Suisun Marsh not otherwise restricted by the BDCP operating criteria.

In-Delta Conveyance Improvements

***[Note to reviewers:** The Two-Gates Fish Protection Demonstration Project is under consideration and will be addressed under a separate regulatory process from BDCP. If an associated longer-term project is carried forward by Reclamation, it could be included in BDCP as an associated Federal action. This activity is also described in the New Water Facilities Construction, O&M section herein in the event that an associated longer-term project is carried forward by DWR.]*