2. RELATED STUDIES, PROJECTS, AND PROGRAMS

This section presents the related activities of various federal and state agencies and numerous local working groups and private organizations in the study area. Many of these entities, including Reclamation, DWR, the California Bay-Delta Authority (CBDA), and the Corps, are currently performing or implementing studies, projects, and programs that are relevant to the NODOS Investigation.

2.1 BUREAU OF RECLAMATION PROJECTS AND PROGRAMS

As the owner and operator of Shasta Dam and Reservoir, Keswick Dam and Reservoir, and various components of the CVP in the study area, Reclamation has a significant effect on existing and future environmental resources in the region. Ongoing projects or continuing programs relevant to the primary study area are described below.

2.1.1 Central Valley Project

The CVP is the largest surface water storage and delivery system in California, with a geographic area covering 35 of California's 58 counties. The project includes the following elements:

- Twenty reservoirs, with a combined storage capacity of approximately 11 million acre-feet (MAF);
- Eight power plants and two pump-generating plants, with a combined generation capacity of approximately 2 million kilowatts (kW); and
- Approximately 500 miles of major canals and aqueducts.

The CVP supplies water to more than 250 long-term water contractors in the Central Valley, the Santa Clara Valley, and the San Francisco Bay Area. Shasta Reservoir currently supplies over 55% of the total annual water supply for the CVP.

Approximately 90% of CVP water is delivered to agricultural users, including prior water rights holders. The CVP has the potential to supply about 7 MAF annually to agricultural and municipal and industrial (M&I) customers and for environmental purposes. Of this 7 MAF, approximately 6.2 MAF is for agricultural uses, 0.5 MAF is for urban users, and 0.3 MAF is for wildlife refuges. Municipal CVP customers include the cities of Redding, Sacramento, Folsom, Tracy, and Fresno; most of Santa Clara County; and the northeastern portion of Contra Costa County. The CVP also provides flood control, navigation, power, recreation, and water quality benefits.

Operation of the CVP is directed by several regulatory requirements and agreements. Prior to passage of the CVPIA, operation of the CVP was affected by State Water Resources Control Board (SWRCB) Decisions 1422 and 1485 (D-1422 and D-1485) and the Coordinated Operations Agreement (COA). Decisions 1422 and 1485 identify minimum flow and water quality conditions at specified locations that are to be maintained in part through operation of the CVP. The COA specifies the responsibilities shared by the CVP and California's SWP for meeting the requirements of D-1485. In December 1994, representatives of the state and federal governments and urban, agricultural, and environmental interests agreed to implementation of the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta) protection plan through the SWRCB to protect the ecosystem of the Bay-Delta Estuary. The Draft

Bay-Delta Water Control Plan, released in May 1995, superseded D-1485. Coordinated operations of the CVP and SWP continue to be based on the COA.

2.1.2 Operational Influences

CVP operations are influenced by general operating rules, regulatory requirements, and facility-specific concerns and requirements. Inflow and release requirements are the principal elements influencing reservoir storage. Operational decisions consider not only conditions at individual reservoirs but also downstream flow conditions at other project reservoirs. Storage space south of the Delta that can only be filled with water exported from the Delta is a major operational consideration involving the geographic distribution of water; it will impact the operation of a potential north-of-the-Delta project. Other factors that influence the operation of CVP reservoirs and, consequently, would influence a potential NODOS Investigation project include flood-control requirements, carryover storage objectives, lake recreation, power production capabilities, cold-water reserves, and pumping costs.

Rivers below some CVP dams support both resident and anadromous fisheries and recreation. While resident fisheries are slightly affected by release fluctuations, anadromous fisheries (e.g., salmon and steelhead) are the most sensitive and are present year-round downstream from some CVP facilities. Maintaining water conditions favorable to spawning, incubation, rearing, and out-migration of juvenile anadromous fish is one of the main objectives of CVP operations. CVP operations are coordinated to anticipate and avoid streamflow fluctuations during spawning and incubation, whenever possible.

2.1.3 CVP Water Users

During development of the CVP, the United States entered into long-term contracts in the Central Valley with many major water rights holders who belong to three major groups: (1) Sacramento River Settlement Contractors, (2) San Joaquin River Exchange Contractors, and (3) Water Service Contractors.

Members of Sacramento River Settlement Contractors primarily claim water rights on the Sacramento River. Because of the significant influence on flows in the Sacramento River, controlled by Shasta Dam, these water right claimants entered into contracts with Reclamation. Most of the agreements established the quantity of water the contractors are allowed to divert from April through October without payment to Reclamation and a supplemental CVP supply allocated by Reclamation.

San Joaquin River Exchange Contractors are contractors who receive CVP water from the Delta via the Mendota Pool. Under exchange contracts, the parties agreed not to exercise their San Joaquin River water rights in exchange for a substitute CVP water supply from the Delta. These exchanges allowed for water to be diverted from the San Joaquin River for use by water service contractors in the San Joaquin Valley and Tulare Lake Basin.

Before construction of the CVP, many irrigators on the western side of the Sacramento Valley, on the eastern and western sides of the San Joaquin Valley, and in the Santa Clara Valley relied primarily on groundwater. With completion of CVP facilities in these areas, irrigators signed agreements with Reclamation for delivery of CVP water as a supplemental supply. Several cities also have similar contracts for M&I supplies; these irrigators and cities are known as CVP Water Service Contractors. CVP water service contracts are between the United States and individual water users or districts and provide for an allocated supply of CVP water to be applied for beneficial uses.

2.1.4 Central Valley Project Improvement Act

The CVPIA was signed into law in October 1992. The general purposes of the CVPIA, as identified by Congress in Section 3402, include the following:

- Protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California;
- Address impacts of the CVP on fish, wildlife, and associated habitats;
- Improve the operational flexibility of the CVP;
- Increase water-related benefits provided by the CVP to the State of California through expanded use of voluntary water transfers and improved water conservation;
- Contribute to the State of California's interim and long-term efforts to protect the Bay-Delta Estuary; and
- Achieve reasonable balance among competing demands for CVP water, including water requirements for fish and wildlife, agriculture, M&I, and power contractors.

The CVPIA redefined the purposes of the CVP to include the protection, restoration, and enhancement of fish and wildlife and associated habitats. The CVPIA identified numerous specific measures and programs to meet the new project purpose and also directed the Secretary of the Interior to operate the CVP consistent with these purposes. The following sections of the CVPIA are important to the NODOS Investigation:

- Those focused on the dedication of a portion of CVP yield for environmental purposes;
- The Anadromous Fish Restoration Program (AFRP), which included a goal of doubling the natural production of anadromous fish in Central Valley rivers and streams;
- The Restoration Fund;
- Urban water supply reliability;
- Water transfers;
- Refuge water supplies;
- Restoration of the San Joaquin, Trinity, and Stanislaus Rivers; and
- A stakeholder process.

2.2 CALFED BAY-DELTA PROGRAM

The CALFED Bay-Delta Program is a cooperative effort among state and federal agencies and California's environmental, urban, and agricultural communities. The Governor of California and the President of the United States initiated work on the program in 1995 to address environmental and water management problems associated with the Bay-Delta system. CALFED has taken a broad approach to addressing four problem areas: (1) water quality, (2) ecosystem quality, (3) water supply reliability, and (4) levee system integrity. Many of the problems and solutions in the Bay-Delta system are interrelated. Program implementation began following circulation of the final Programmatic Environmental Impact Statement/Environmental Impact Report (PEIS/EIR) and signing of the ROD in August 2000.

The Preferred Program Alternative (PPA) in the CALFED ROD consists of programmatic elements that set the long-term direction of the CALFED program to meet its Mission Statement and objectives. The PPA has several interrelated programs and includes a series of actions to execute the programs. Implementation of the CALFED programs depends on authorization and funding from participating state and federal agencies. The PPA is expected to take 25 to 30 years to complete. Implementation is roughly divided into several stages, with Stage 1 lasting seven years.

In 2003, the State of California formed the CBDA to oversee the implementation of the CALFED Bay-Delta Program and to work cooperatively with 25 state and federal agencies to implement the CALFED PPA. The California Bay-Delta Act of 2003 established the CBDA as the new governance structure and charged it with providing accountability; ensuring balanced implementation, tracking, and assessment of CALFED Program progress; using sound science; assuring public involvement and outreach; and coordinating and integrating related government programs.

The CALFED Bay-Delta Program covers 12 major elements:

- Water Quality;
- Science;
- Water Management;
- Ecosystem Restoration;
- Levee System Integrity;
- Water Use Efficiency;
- Water Transfer;
- Watershed;
- Storage;
- Conveyance;
- Environmental Water Account; and
- Governance.

All aspects of the CALFED Bay-Delta Program are interrelated and interdependent. The success of all of the elements depends upon expanded and strategically managed storage. No single program element can address the problems, nor is any one element seen as a stand alone alternative to the others; all 12 program elements are essential.

2.2.1 CALFED Bay-Delta Program Mission Statement, Objectives, and Solution Principles

The mission of the CALFED Bay-Delta Program is to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

CALFED developed the following solution objectives:

- Provide good water quality for all beneficial uses;
- Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species;

- Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system; and
- Reduce the risk to land use and associated economic activities, water supply, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

In addition, any CALFED solution must satisfy the following six solution principles:

- **Reduce Conflicts in the System –** Solutions will reduce major conflicts among beneficial uses of water.
- **Be Equitable –** Solutions will focus on solving problems in all problem areas. Improvements for some problems will not be made without corresponding improvements for other problems.
- **Be Affordable –** Solutions will be implementable and maintainable within the foreseeable resources of the program and stakeholders.
- **Be Durable –** Solutions will have political and economic staying power and will sustain the resources they were designed to protect and enhance.
- **Be Implementable –** Solutions will have broad acceptance and legal feasibility and will be timely and relatively simple to implement, compared with other alternatives.
- **Have No Significant Redirected Impacts –** Solutions will not solve problems in the Bay-Delta system by redirecting significant negative impacts, when viewed in their entirety, within the Bay-Delta or to other regions of California.

2.2.2 CALFED Programs

Major CALFED programs consist of Storage, Conveyance, Water Transfer, Environmental Water Account, Water-Use Efficiency, Water Quality, Levee System Integrity, and Ecosystem Restoration and Watershed Management. These programs are described below:

- **Storage** – The Water Storage Program seeks to develop additional storage capacity to help meet the needs of California's growing population and to provide increased system flexibility to help improve water quality and restore ecosystems. The program consists of increasing the storage capacity at existing reservoirs and strategically located offstream sites and implementing major expansion of groundwater storage. CALFED is looking at five major surface storage projects and additional groundwater storage to obtain broad water benefits. The five major surface storage projects include: Enlargement of Shasta Lake, Los Vaqueros Enlargement, In-Delta storage, Upper San Joaquin River Basin Storage Investigation, and NODOS.
- **Conveyance** – As part of the Conveyance Program, DWR and Reclamation have proposed to implement the South Delta Improvements Program (SDIP) to improve water management and coordination between state and federal projects. The SDIP is comprised of two major components: (1) a physical/structural component that includes operable gates at up to four locations, channel dredging to improve conveyance, and modification of 24 agricultural diversions and (2) an operational component that includes raising the permitted diversion limit into the SWP Clifton Court Forebay from 6,680 cubic feet per second (cfs) to 8,500 cfs. The SDIP Draft EIS/EIR was released October 2005.

- **Water Transfer** – Potential water transfers are being evaluated to minimize the effects of a drought. Work is continuing on promoting an effective water transfer market that protects water rights, the environment, and local economies.
- **Environmental Water Account** – The EWA Program consists of two primary elements: (1) assisting fish population recovery for at risk native fish species and (2) increasing water supply reliability by reducing uncertainty associated with fish recovery actions. The EWA is aimed at adding flexibility to the state's water delivery system for providing water at critical times to meet environmental needs without water supply impacts on cities, farms, and businesses. The EWA gives water managers the tools to acquire, store, transfer, and release water strategically to respond to real-time ecosystem needs. By providing water that otherwise would not be available, EWA helps to resolve one of the Bay-Delta's most fundamental conflicts: the competing water needs of the environment and people. The EWA buys water from willing sellers or diverts surplus water when safe for fish, then EWA banks, stores, transfers, and releases the water as needed to protect fish and to compensate water users. The 2004 EWA Record of Decision (ROD) and Notice of Determination implement the EWA Flexible Purchase Alternative described in the final EIS/EIR through December 31, 2007. The CALFED ROD defined the EWA as a four-year program, unless EWA agencies agree to a program extension.
- **Water-Use Efficiency** – The goal of the Water-Use Efficiency Program is to aggressively make the best use of existing water supplies through defining appropriate water measurement, certifying urban best management practices (BMPs), and refining quantifiable objectives for agricultural water-use efficiency. The program supports local water conservation and recycling projects. Savings achieved by the Water-Use Efficiency Program will be accomplished through incentive-based, voluntary programs.
- **Water Quality** – The focus of the Water Quality Program is to improve water quality from source to tap for Californians whose drinking water supplies come from the Bay-Delta watershed. Among other projects, the program includes developing source improvements and drainage management programs.
- **Levee System Integrity** – The purpose of the Levee System Integrity Program is to reduce the threat of levee failure and seawater intrusion to protect water supplies, water quality, major roadways, cities, towns, agricultural lands, and environmental and aquatic habitat, primarily in the Delta.
- **Ecosystem Restoration and Watershed Management** – The ERP consists of improving the ecological health of the Bay-Delta watershed through restoring and protecting habitats, ecosystem functions, and native species. Primary program elements include (1) an annual grant program to fund local projects for habitat restoration, fish passage, invasive species management, and environmental water quality; (2) habitat restoration in the Delta and its tributary watersheds; (3) stream flow augmentation in upstream areas through voluntary water purchases; (4) fish passage improvements through modification or removal of dams, improved bypasses, and ladders; (5) integration of flood management and ecosystem restoration; (6) support for efforts to manage watersheds that affect the Bay-Delta system, development of watershed assessments and plans, and implementation of specific watershed conservation, maintenance, and restoration actions; and (7) management of the EWA.

2.2.3 Notice of Initiation of Federal Feasibility Studies

The CALFED Bay-Delta Program completed the Final Programmatic EIS/EIR in July 2000. The programmatic EIS/EIR identified potential surface reservoir sites and many possible groundwater storage sites. CALFED agencies adopted a ROD for the program in August 2000.

The ROD identified five surface storage projects to be pursued during the first stage of the CALFED program. Reclamation received feasibility study authority for three of those projects in the Omnibus Appropriations Act of 2003 (Public Law 108-7). Reclamation issued a Notice of Initiation of Federal Feasibility Studies on September 30, 2003, indicating that federal feasibility studies have been initiated for the NODOS Investigation, Los Vaqueros Expansion, and Upper San Joaquin River Basin Storage Investigation.

Specifically for NODOS, the Notice of Initiation of Federal Feasibility Studies indicated that according to the ROD and Public Law 108-7, up to 1.9 MAF of offstream storage at the proposed Sites Reservoir or other locations in the Sacramento Valley are being investigated. The proposed project would work with other projects in a balanced way to enhance water management flexibility, increase the reliability of supplies, reduce diversions on the Sacramento River during critical fish migration periods, and provide storage and operational benefits to other CALFED programs including Delta water quality and the EWA.

2.3 PROGRAM MANAGEMENT BY THE BUREAU OF LAND MANAGEMENT

DOI's Bureau of Land Management (BLM) is responsible for the administration of natural resources, lands, and mineral programs on approximately 250,000 acres of public land in northern California. BLM lands within the study area are located predominantly west of the Sacramento River and include the 17,000-acre Sacramento River Bend area south of Jelly's Ferry and off-highway vehicle areas near Shasta Lake. BLM has been involved in numerous restoration and conservation projects in area watersheds, including the Clear Creek Floodplain Restoration Project. BLM also has a responsible role in implementing the Northwest Forest Plan.

Over 40,000 acres of public lands along the Sacramento River between Redding and Red Bluff have been proposed for designation as National Conservation Areas. Designation as a National Conservation Area prevents construction of dams or other instream infrastructure and ensures continued public access to the lands. Other areas that have been proposed as National Conservation Areas or National Wilderness Destinations within the primary study area include the Backbone/Sugarloaf wilderness area, the Girard Ridge area (northeast of Shasta Lake), the Devil's Rock area adjacent to Squaw Creek near Shasta Lake, and the Beegum area in the Cottonwood Creek watershed. The BLM determined that 25 miles of the Sacramento River and about 7 miles of Paynes Creek are eligible for National Wild and Scenic River status, and BLM has acquired roughly 17,000 acres in the Sacramento River Bend management area. Congressional action is required to confirm these proposed designations.

2.4 NOAA FISHERIES SALMON AND STEELHEAD PROPOSED RECOVERY PLAN

National Oceanic and Atmospheric Administration (NOAA) Fisheries has designated critical habitat for the federally listed winter-run Chinook salmon to be the Sacramento River from Keswick Dam downstream to the Golden Gate Bridge. The Central Valley recovery planning domain also includes Central Valley spring-run Chinook salmon, Central Valley steelhead, and federal candidate species fall/late fall-run Chinook salmon. Clear, Cow, Bear, Battle, and Cottonwood Creeks have been identified

as essential fish habitat. The *Proposed Recovery Plan for Sacramento River Winter-Run Salmon* (NMFS, 1997), presents restoration goals and actions, some of which would be applied within the NODOS Investigation study area. Proposed elements include the following.

- **Provide suitable water temperatures for spawning, egg incubation, and juvenile rearing between Keswick Dam and Red Bluff** – Actions include operating the CVP to consistently attain water temperature objectives, operating and maintaining temperature control curtains at Whiskeytown and Lewiston reservoirs, and regulating the river and reservoir system using a comprehensive temperature monitoring program and model.
- **Reduce pollution in the Sacramento River from Iron Mountain Mine** – Actions include alleviating pollution problems from the mine during winter-run incubation periods, treating and/or controlling heavy metal waste prior to discharge to the Sacramento River, diluting heavy metal waste discharges through effective water management, eliminating scouring of toxic metal-laden sediments in Spring Creek and Keswick reservoirs, and monitoring metal concentrations and waste flows.
- **Provide optimum flows in the Sacramento River between Keswick Dam and Chipps Island** – Actions include maintaining flows of 5,000 to 5,500 cfs from October through April, when possible; eliminating adverse flow fluctuations by modifying Anderson Cottonwood Irrigation District (ACID) dam operations, or by modifying or replacing the facility; and inventorying and assessing water withdrawal sites and taking action to increase stream flows.
- **Protect and maintain gravel resources in the Sacramento River and its tributaries between Keswick Dam and Red Bluff** – Actions include restoring and replenishing spawning gravel in the Sacramento River, implementing a plan to protect natural sources of spawning gravel along the Sacramento River and its tributaries, and controlling excessive silt discharges from tributary watersheds to protect spawning gravel.

Some of these actions are ongoing or are currently under study.

2.5 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY IRON MOUNTAIN MINE RESTORATION

EPA is involved in remediation and cleanup activities related to the Iron Mountain Mine Superfund site in the Spring Creek drainage west of the Sacramento River. Acid mine drainage from the former copper mine has significantly impacted the Spring Creek watershed and caused fish kills in the Sacramento River. This site is being addressed through interim emergency actions and long-term remedial phases focusing on water management and cleanup of major sources in Boulder Creek, the Old Mine/No. 8 Mine, area source acid mine drainage discharges, and sediments. Remedial actions taken to date have significantly reduced acid and metal contamination in surface water. Additional planned activities include construction of an acid mine drainage treatment plant in the Boulder Creek watershed.

2.6 UNITED STATES ARMY CORPS OF ENGINEERS SACRAMENTO VALLEY PROGRAMS

Numerous projects, programs, and studies by the Corps affect the Sacramento River and its tributaries. Flood control projects range from various dams and reservoirs, hundreds of miles of levee and channel improvements, and a flood bypass system.

The Sacramento and San Joaquin River Basins Comprehensive Study (Comp Study) made recommendations for actions that could influence flood damage reductions and ecosystem restoration conditions along the Sacramento and San Joaquin Rivers. These actions and a strategy for implementation were provided in an Interim Report developed in December 2002. The recommendations of the Comp Study may be incorporated into future studies.

2.7 CALIFORNIA DEPARTMENT OF WATER RESOURCES PROJECTS AND PLANS

This section presents DWR programs and projects that could affect the NODOS Investigation.

2.7.1 State Water Project

The SWP was authorized in 1959 and designated to readjust geographical imbalances between California's water resources and water needs. The project extends from Plumas County in the north to Riverside County in the south. Completed project elements include 23 dams and reservoirs, 6 power plants, 17 pumping plants, and 533 miles of aqueduct. The principal storage feature of the SWP is Lake Oroville, with a gross pool capacity of 3.5 MAF. Lake Oroville is on the Feather River, about 4 miles northeast of Oroville. Water released from Oroville Dam flows through the Feather and Sacramento Rivers to reach the Delta. The SWP delivers water to service areas of the Feather River basin, San Francisco Bay area, San Joaquin Valley, Tulare basin, and southern California. Major SWP conveyance facilities in the Central Valley include the North Bay, South Bay, and California aqueducts. The North Bay Aqueduct diverts water from the north Delta, near Cache Slough, for agricultural and M&I uses in Napa and Solano Counties. The South Bay and California aqueducts carry water from the Delta to the San Francisco Bay area and to southern California, respectively. In the southern portion of the Delta, the Harvey O. Banks (Banks) Pumping Plant lifts water into the California Aqueduct from the Clifton Court Forebay. At 444 miles, the California Aqueduct is the state's largest and longest water conveyance system, beginning at Banks Pumping Plant and extending to Lake Perris, south of Riverside in southern California.

The SWP has contracted a total of 4.23 MAF for average annual delivery in the San Joaquin Valley, central coast, and San Francisco and south coast areas. Of this amount, about 2.5 MAF is designated for the SWP water users in southern California, nearly 1.36 MAF for the San Joaquin Valley, and the remaining 370,000 acre-feet (AF) for San Francisco Bay, the central coast, and Feather River areas.

SWP contracts involve the Feather River Settlement Contractors and SWP Contract Entitlements. The Feather River Settlement Contractors are water users who hold riparian and senior appropriative rights on the Feather River. SWP Contract Entitlements are contracts executed in the early 1960s that established the maximum annual water amount (entitlement) that each long-term contractor may request from the SWP.

2.7.2 California Water Plan

The State DWR prepares and publishes the California Water Plan Update through its Bulletin 160 series. Seven versions of the plan were published between 1966 and 1998. These previous plans assessed California's agricultural, environmental, and urban water uses and associated supplies and then determined a current and future shortage or gap between supplies and uses. The 1998 plan also included a list of water management options that could be implemented to meet identified shortages.

The recently released 2005 Update was prepared using a collaborative process, with a 65-member advisory committee, an extended review forum, and input from the public. California Water Plan Update 2005 identifies pressing issues and includes a strategic plan presenting goals, policy recommendations, and actions to ensure sustainable water uses and reliable water supplies in the face of uncertainty and change. These uncertainties are recognized in the development of three 2030 water demand scenarios that demonstrate how numerous factors significantly influence future water demands.

The 2005 Update's direction for water management through 2030 includes three foundational actions to ensure sustainability and two initiatives for water resources reliability. Actions to ensure sustainability include (1) use water efficiently, (2) protect water quality, and (3) support environmental stewardship. Initiatives to ensure the reliability of water resources include (1) implement integrated regional water management and (2) maintain and improve statewide water management systems. The Water Plan Update also includes water balances for California, showing water uses and supplies for three recent years. The 2005 Update directs local, regional and state decision makers to select from a listing of 25 water resource management strategies available for potential use.

2.8 CALIFORNIA DEPARTMENT OF FISH AND GAME RESTORATION AND RECOVERY PROGRAMS

The California Department of Fish and Game (CDFG) is responsible for managing California's fish and wildlife resources and overseeing the restoration and recovery of threatened and endangered species under the California Endangered Species Act (ESA). CDFG participates in conservation planning, environmental compliance and permitting, coordinated resource management planning, and restoration and recovery programs. CDFG is involved in numerous investigations, projects, and monitoring activities in the study area, including fish passage, riparian restoration, and aquatic habitat restoration. The Wildlife Conservation Board (WCB), established under CDFG, administers a capital outlay program for wildlife conservation and related recreation projects.

2.9 INTERAGENCY ECOLOGICAL PROGRAM ON PELAGIC ORGANISM DECLINE

Over the last few years, abundance indices calculated by the Interagency Ecological Program (IEP) show unexpected declines in numerous pelagic fishes and zooplankton in the Upper San Francisco Estuary (the Delta and Suisun Bay). The recent low levels were unexpected, given the relatively moderate winter-spring flows of the past several years. The abundance indices have shown record or near record lows for delta smelt, striped bass, longfin smelt, and threadfin shad at various life stages. Monitoring has also indicated a substantial decrease in several species of zooplankton that serve as the primary food source for pelagic fishes during some stages of development. Studies on the decline of pelagic organisms represent an interdisciplinary, multi-agency effort including staff from CDFG, DWR, Reclamation, EPA, the United States Geological Survey (USGS), and the University of California campus in Davis, CA. IEP develops annual work plans to augment monitoring, perform new data analyses, and conduct special studies to investigate threats to pelagic fish and their prey. Conceptual modeling conducted by the IEP indicate that at least three factors, individually or in combination, contribute to lower pelagic productivity: (1) toxins, (2) invasive species, and (3) water project operations (IEP, July 2005).

2.10 SWRCB PHASE 8 DELTA WATER QUALITY REQUIREMENTS

After many years of struggling to develop water quality standards for the Delta, the Bay-Delta Accord (Accord) was signed by multiple partners in 1994. The Accord set water quality standards and required

the SWRCB to determine which water users would be responsible to meet these standards. In 1995, SWRCB adopted a Water Quality Control Plan and proceeded to implement the Phase 8 requirements affecting Sacramento Valley water users. DWR and Reclamation, as operators of state and federal export projects, respectively, have claimed that certain water rights holders in the Sacramento Valley must cease diversions or release water from storage to help meet water quality standards in the Delta. Sacramento Valley users have claimed that their water use has not contributed to any water quality problems in the Delta and, as senior water rights holders and water users within the watershed and counties of origin, they are not responsible for meeting these standards.

Rather than continue these adversarial proceedings, Sacramento Valley water users, DWR, Reclamation, and export water users agreed to defer Phase 8 and instead, work in a more cooperative spirit to meet water supply, quality, and environmental needs in areas of origin and throughout California. This cooperation is evidenced in the Sacramento Valley Water Management Agreement (Agreement). The Agreement consists of four successive agreements: (1) Stay Agreement, (2) Short-Term Settlement Agreement, (3) Short-Term Project Implementation Agreements, and (4) Long-Term Agreements. The Agreement includes a process to resolve Phase 8 and related issues and a set of milestones for implementing short- and long-term projects. The Agreement also specifically identifies Sites Reservoir and Shasta Enlargement as potential long-term projects.

As part of the Short-Term Settlement Agreement, active parties developed a long-term work plan and expanded program to guide implementation of the Long-Term Agreements. The Short-Term Agreement will continue to 2014 or until it is replaced by the Long-Term Agreement. The Short-Term Agreement includes the following provisions.

- DWR and Reclamation remain obligated under a SWRCB order to meet Delta water quality standards during the term of the agreement.
- Unmet demands should be met in the Sacramento Valley, including 25,000 AF of CVP water supplies for use along the Tehama-Colusa Canal and assurances that Feather River supplies can be used in the Sutter Bypass/Butte Slough region during dry years.

During development of the Short-Term Agreement, a work plan was developed. The Short-Term Agreement work plan identified and evaluated approximately 45 projects (i.e., projects that could be implemented within one to two years), including conjunctive management and surface storage reoperation projects. These projects will be developed to provide up to 185,000 AF of capacity during below-normal, dry, and critically dry years. This capacity will be dedicated to two equal blocks. The first block (up to 92,500 AF) will be made available for local use within the local agency boundary. If this water is not needed locally, it will be made available to the CVP and SWP at a negotiated rate. The second block of water (up to 92,500 AF) will be provided to the SWP and CVP for Water Quality Control Plan relief.

2.11 OTHER FEDERAL, STATE, AND LOCAL PROGRAMS AND PROJECTS

Numerous other federal, state, and local programs and projects influence the development of water resources projects and programs in the Central Valley.

2.11.1 Sacramento River Conservation Area Program

California Senate Bill 1086 called for a management plan for the Sacramento River and its tributaries to protect, restore, and enhance both fisheries and riparian habitat. The Sacramento River Conservation Area Program has an overall goal of preserving remaining riparian habitat and reestablishing a continuous

riparian ecosystem along the Sacramento River between Redding and Chico, and reestablishing riparian vegetation along the river from Chico to Verona. The program is to be accomplished through an incentive-based, voluntary river management plan. The Upper Sacramento River Fisheries and Riparian Habitat Management Plan, January 1989 (Resources Agency of California, 1989), identifies specific actions to help restore the Sacramento River fishery and riparian habitat between the Feather River and Keswick Dam. *The Sacramento River Conservation Area Forum Handbook* (Sacramento River Conservation Area Forum, 2003) is a guide to implementing the program.

The Keswick Dam to Red Bluff portion of the conservation area includes areas within the 100-year floodplain, existing riparian bottomlands, and areas of contiguous valley oak woodland, totaling approximately 22,000 acres. The 1989 fisheries restoration plan recommended several actions specific to the study area, including:

- Fish passage improvements at Red Bluff Diversion Dam (under way, project Draft EIS/EIR released August 2002);
- Modification of Spring Creek Tunnel intake for temperature control (completed);
- Spawning gravel replacement program (ongoing);
- Development of side-channel spawning areas, such as those at Turtle Bay in Redding (ongoing);
- Structural modifications to the ACID dam to eliminate short-term flow fluctuations (completed);
- Maintaining instream flows through coordinated operation of water facilities (ongoing);
- Improvements at the Coleman National Fish Hatchery (partially complete);
- Measures to reduce acute toxicity caused by acid mine drainage and heavy metals (ongoing);
- Various fisheries improvements on Clear Creek (partially complete);
- Flow increases, fish screens, and revised gravel removal practices on Battle Creek (beginning summer 2006); and
- Control of gravel mining, improvements of spawning areas, improvements of land management practices in the watershed, and protection and restoration of riparian vegetation along Cottonwood Creek.

2.11.2 Riparian Habitat Joint Venture

The Riparian Habitat Joint Venture (RHJV) was initiated in 1994 and includes signatories from 18 federal, state, and private agencies. The RHJV promotes conservation and the restoration of riparian habitat to support native bird population through three goals:

- Promote an understanding of the issues affecting riparian habitat through data collection and analysis;
- Double riparian habitat in California by funding and promoting on-the-ground conservation projects; and
- Guide land managers and organizations to prioritize conservation actions.

RHJV conservation and action plans are documented in the Riparian Bird Conservation Plan (RHJV, 2000). The conservation plan targets 14 "indicator" species of riparian-associated birds and provides recommendations for habitat protection, restoration, management, monitoring, and policy. The

report notes habitat loss and degradation as one of the most important factors causing the decline of riparian birds in California. RHJV has participated in monitoring efforts within the Sacramento National Wildlife Refuge Complex and other conservation areas. The RHJV's conservation plan identifies Lower Clear Creek as a prime breeding area for yellow warblers and song sparrows, advocating a continuous riparian corridor along lower Clear Creek. Other recommendations of the conservation plan apply to the NODOS Investigation study area in general.

2.11.3 Resource Conservation Districts

There are numerous resource conservation districts (RCDs) within the study area. Once known as Soil Conservation Districts, RCDs were established under California law with a primary purpose to implement local conservation measures. Although RCDs are locally governed agencies with locally appointed, independent boards of directors, they often have close ties to county agencies and the National Resource Conservation Service. RCDs are empowered to conserve resources within their districts by implementing projects on public and private lands and to educate landowners and the public about resource conservation. They are often involved in the formation and coordination of watershed working groups and other conservation alliances. In the Shasta Lake and upper Sacramento River vicinity, districts include the Western Shasta County RCD and the Tehama County RCD. To the east are the Fall River and Pit River RCDs, and to the west and north are the Trinity County and Shasta Valley RCDs.

2.12 OTHER PROGRAMS BY PRIVATE ORGANIZATIONS

There are many other programs and private organizations related to NODOS Investigation. Several groups have been active in the study area in the past decade and have helped in fishery recovery and watershed restoration. Several groups closely tied to the NODOS Investigation are described in this section.

- **Sacramento Watersheds Action Group** – The Sacramento Watersheds Action Group (SWAG) is a nonprofit corporation that secures funding for, designs, and implements projects that provide watershed restoration, streambank and slope stabilization, erosion control, watershed analysis, and road removal. SWAG has successfully worked with local groups, agencies, and organizations to fund and complete restoration projects on the Sacramento River and tributaries downstream from Keswick Dam. Their projects include development of the Sulphur Creek Watershed Analysis and Action Plan, the Whiskeytown Reservoir Shoreline Erosion Control Project, the Sulphur Creek Crossing Restoration Project, and the Lower Sulphur Creek Realignment and Riparian Habitat Enhancement Project. SWAG is a potential local sponsor for watershed restoration actions in the study area.
- **Sacramento River Watershed Program** – The Sacramento River Watershed Program is an effort to bring stakeholders together to share information and work together to address water quality and other water-related issues within the Sacramento River watershed. The group is funded congressionally through EPA. The program's primary goal is "to ensure that current and potential uses of Sacramento River watershed resources are sustained, restored, and where possible, enhanced while promoting the long-term social and economic vitality of the region."

  The Sacramento River Watershed Program manages grants for the Sacramento River Toxic Pollutants Control Program; performs extensive water quality monitoring, data collection, and data management for the watershed; and is instrumental in the study and monitoring of toxic pollutants. Although the program does not implement restoration projects, it is a potential

provider of technical information for future water quality improvement programs in the study area.

- **Battle Creek Watershed Conservancy** – The Battle Creek Watershed Conservancy (BCWC) is actively involved in monitoring actions connected to the Battle Creek Salmon and Steelhead Restoration Project. BCWC participates in numerous working groups associated with projects on Battle Creek, including the Battle Creek Working Group, Adaptive Management Working Group, Coleman National Fish Hatchery meetings, Spring-Run Group, Steelhead Group, and CALFED Watershed Program Workgroup. BCWC administered the first phase of projects on Battle Creek, including conservation easements, noxious weed controls, and restoration in the lower watershed. The group is a potential partner in future restoration actions in the Battle Creek watershed.
- **Butte Creek Watershed Conservancy** – The Butte Creek Watershed Conservancy was formed in September 2005 to encourage the preservation and management of the Butte Creek watershed through cooperation between landowners, water users, recreational users, conservation groups, and local, state, and federal agencies. The Butte Creek Watershed Conservancy received non-profit status in November 1996 and shortly after prepared a MOU with 24 signatories to establish a voluntary and cooperative agreement to create the Butte Creek Watershed Management Strategy. The Butte Creek Watershed Conservancy working with Ducks Unlimited, the California Waterfowl Association, and other stakeholders developed alternatives to improve fish passage in the Butte Sink, Butte Slough, and Sutter Bypass sections of Butte Creek while maintaining the viability of agriculture, seasonal wetlands, and other habitats.
- **Sacramento River Preservation Trust –** The Sacramento River Preservation Trust is a private, nonprofit organization active in environmental education and advocacy to preserve the natural environmental values of the Sacramento River. The Trust has participated in various conservation and land acquisition projects, including securing lands for the Sacramento River National Wildlife Refuge. Although the group has had limited activity in the study area, it is pursuing designation of a portion of the Sacramento River between Redding and Red Bluff as a National Conservation Area (see previous discussion on BLM activities).
- **Shasta Land Trust –** The Shasta Land Trust is a regional, nonprofit organization dedicated to conserving open space, wildlife habitat, and agricultural land. The Trust works with public agencies and private landowners and is funded primarily through membership dues and donations. It employs various voluntary programs to protect and conserve valuable lands using conservation easements, land donations, and property acquisitions. Current efforts include work in the Cow Creek and Bear Creek watersheds. The Shasta Land Trust has purchased or negotiated conservation easements in Fenwood Ranch of southern Shasta County and various properties east of Redding. The Trust is a potential local partner for restoration activities in the Shasta Dam to Red Bluff subarea.
- **The Trust for Public Land** – The Trust for Public Land is a national, nonprofit organization involved in preserving lands with natural, historic, cultural, or recreational value, primarily through conservation real estate. The Trust's Western Rivers Program has been involved in conservation efforts along the Sacramento River between Redding and Red Bluff (the BLM's Sacramento River Bend Management Area), Battle Creek, Paynes Creek, Inks Creek, and Fenwood Ranch in Shasta County. The group promotes public ownership of conservation lands to ensure public access and enjoyment.
- **Cantara Trustee Council –** The Cantara Trustee Council administers a grant program that has provided funding for numerous environmental restoration projects in the primary study area, including programs in the Fall River watershed, Sulphur Creek, upper Sacramento River, Middle

Creek, lower Clear Creek, Battle Creek, Salt Creek, and Olney Creek. The Cantara Trustee Council is a potential local sponsor for future restoration actions in the primary study area. The Cantara Trustee Council includes representatives from CDFG, the United States Fish and Wildlife Service (USFWS), the Central Valley Regional Water Quality Control Board (RWQCB), California Sportfishing Protection Alliance, and Shasta Cascade Wonderland Association.

- **The Nature Conservancy –** The Nature Conservancy (TNC) is a private, nonprofit organization involved in environmental restoration and conservation throughout the United States and the world. TNC approaches environmental restoration primarily through strategic land acquisition from willing sellers and obtaining conservation easements. Some of the lands are retained by TNC for active restoration, research, or monitoring activities, while others are turned over to government agencies such as USFWS or CDFG for long-term management. Lower in the Sacramento River Basin, the TNC has been instrumental in acquiring and restoring lands in the Sacramento River National Wildlife Refuge and managing several properties along the Sacramento River. It also has pursued conservation easements on various properties at tributary confluences, including Cottonwood and Battle Creeks. Within the study area, TNC manages the McCloud River Preserve and lands within the Lassen Foothills Project.
- **California Trout –** California Trout (CalTrout) is a private, nonprofit organization with a mission to protect and restore wild trout and steelhead and their waters throughout California. CalTrout conservation priorities include the Wild Trout Campaign, grazing reform on public lands, hydropower and dam regulation, and the Steelhead Recovery Campaign. In 1999, CalTrout completed the Conservation Plan for the New Millennium (CalTrout, 1999), which sets forth restoration policies and details site-specific restoration projects or actions to support steelhead and trout fisheries statewide. CalTrout focuses much of its efforts on flow regulation, including the operation of dams and hydropower facilities to benefit native fisheries. CalTrout has been involved in numerous Federal Energy Regulatory Commission (FERC) dam relicensing projects, including current relicensing efforts on the Pit and Hat Rivers. Other activities include stream restoration and protection projects. CalTrout is a potential partner in future fisheries restoration programs in the study area.

2.13 COMMON ASSUMPTIONS FOR CALFED SURFACE WATER STORAGE PROJECTS

Both DWR and Reclamation are completing planning feasibility studies for other elements of the PPA described in the CALFED ROD. In addition to NODOS, Reclamation has initiated federal feasibility studies for the Los Vaqueros Reservoir Expansion, Upper San Joaquin River Basin Storage Investigation, and the Shasta Lake Water Resources Investigation. DWR has completed a draft FS Report for the In-Delta Storage Project; however, Reclamation currently lacks FS authority for the In-Delta Storage Project. These other efforts are noted because of the interdependence of these elements with the NODOS Investigation in comprising the PPA.

DWR and Reclamation, in coordination with the California Bay-Delta Authority, initiated the Common Assumptions process to develop consistency and improve efficiency among the surface storage investigations. While each of these investigations addresses a unique purpose to meet different combinations of water supply reliability, water quality, and environmental needs, all of the investigations share some common requirements that include completing planning reports and feasibility studies and associated alternatives analyses to comply with CEQA, NEPA, and Clean Water Act Section 404 requirements. To ensure that the surface storage project teams use consistent assumptions and analytical

approach, the Common Assumptions effort will define the CEQA (existing) and NEPA (future no-action) baseline conditions and develop common analysis tools, common model codes, common policy decisions, common regulatory assumptions, common analytical approaches and methodologies, and common reporting metrics for model results for use by the storage investigations in the Plan Formulation and Feasibility Study Reports.