

# Chapter 1 Introduction

The management of California’s water resources has reached a critical point and the challenges to water management are great and varied. This report provides information on how active surface storage investigations are evaluating alternatives to address regional and statewide challenges related to water supply reliability, declining ecosystems, water quality, flood protection, hydropower generation, and recreation opportunities. Further, this report discusses uncertainties related to climate change and water management in the Sacramento-San Joaquin Delta (Delta) (See Box 1-1 for a list of acronyms and abbreviations used in this section) and how these uncertainties impact the surface storage investigations.

## Background

The California Water Plan Update 2009 states that “California is facing one of the most significant water crises in its history” and it is “imperative to act.” Drought impacts have been intensified by reduced water supplies and a growing population. The current drought is similar to that experienced in 1977, but the current population is 75 percent greater. Fish populations, ecosystems, and water quality continue to decline, particularly in the Delta and its tributaries. Water deliveries from the Delta have been reduced due to court decisions and new regulations designed to protect critical species and habitat. Climate change is altering precipitation patterns, reducing snowpack, causing sea level rise, and increasing the potential for both long drought periods and floods (i.e., more variable precipitation). The existing water management system needs to be reevaluated in light of climate change, as the assumptions used to design and operate our current system of reservoirs, channels, aqueducts, and other water management facilities may no longer be valid since it was designed using historical hydrology as an indicator of future conditions. The current system is aging—the State Water Project is more than 35 years old and the federal Central Valley Project is more than 50 years old—and upgrades have not kept pace with changing conditions. (DWR, 2009a)

Our existing water resources infrastructure is already strained to meet competing demands and existing objectives for multiple uses, including water supply, environmental protection, water quality, flood protection, hydropower, navigation and recreation. The strains on the system will only increase with a changing climate and the conflicts between competing interests will be even greater as supplies become less reliable and ecosystems are further strained. The Delta Vision Blue Ribbon Task Force and the CALFED Bay-Delta Program (CALFED) both recognized the value and need for additional storage in the context of our strained water system. The California Water Plan Update 2009 draws a similar conclusion. In a listing of objectives and actions, the plan describes a need to, “advance and expand conjunctive management of multiple water supply sources with existing and new surface water and groundwater storage to prepare for future droughts, floods, and climate change.” Further, new state water legislation was enacted in 2009 (See Appendix A. 2009 Comprehensive Water Package) that includes a bond measure that would provide up to \$3 billion for public benefits associated with potential storage projects, if the measure is approved by voters. Public benefits paid for by the bond would include ecosystem restoration, flood control, water quality, emergency response, and recreation. According to the bond proposal, water supply reliability benefits for urban or agricultural users would be paid for by those beneficiaries.

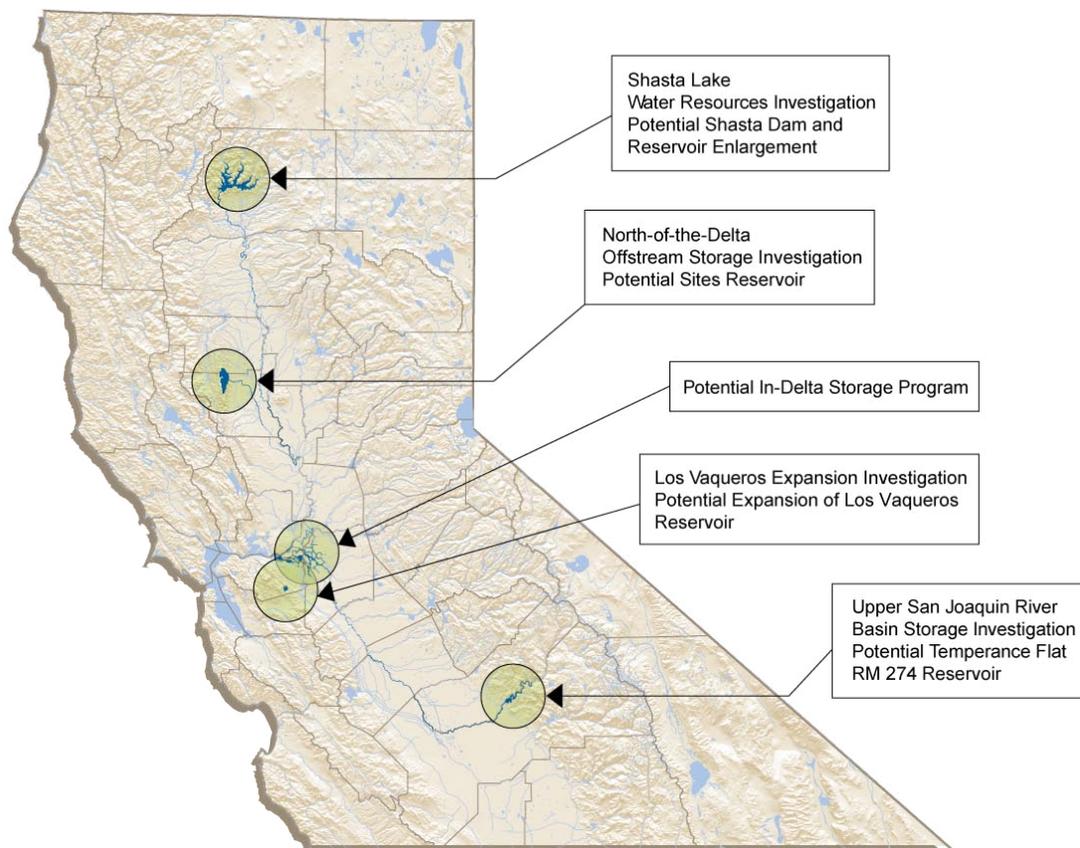
**Box 1-1. Chapter 1 Acronym and Abbreviation List**

BDCP	Bay-Delta Conservation Plan
BO	Biological Opinion
CALFED	CALFED Bay-Delta Program
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
Delta	Sacramento-San Joaquin Delta
DHCCP	Delta Habitat Conservation and Conveyance Program
DWR	Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
IAIR	Initial Alternatives Information Report
LVE	Los Vaqueros Expansion
NEPA	National Environmental Policy Act
NODOS	North-of-the-Delta Offstream Storage
PFR	Plan Formulation Report
Reclamation	United States Bureau of Reclamation
SLWRI	Shasta Lake Water Resources Investigation
USJRBSI	Upper San Joaquin River Basin Storage Investigation
WRC	Water Resources Council

Through the CALFED Surface Storage Program, CALFED agencies evaluated 52 potential surface storage reservoir sites. CALFED agencies specifically looked for potential projects that could provide broad benefits for water supply, flood control (i.e., flood protection), water quality, and ecosystem restoration. An interagency team drawn from the CALFED participating agencies eliminated 40 of the potential surface storage sites during an initial screening (CALFED, 2000a). Of the 12 potential surface storage sites identified in the CALFED Final Programmatic Environmental Impact Statement (EIS)/Environmental Impact Report (EIR), five surface storage sites were included in the CALFED Record of Decision for further study and consideration: Sites Reservoir, additional storage in the upper San Joaquin River watershed, expansion of Los Vaqueros Reservoir, expansion of Shasta Lake, and In-Delta storage project. As state and federal legislation was enacted and appropriations were provided, these studies became recognized as the: North-of-the-Delta Offstream Storage (NODOS) Investigation, Upper San Joaquin River Basin Storage Investigation (USJRBSI), Los Vaqueros Expansion (LVE) Investigation, Shasta Lake Water Resources Investigation (SLWRI), and In-Delta Storage Program. State participation in the In-Delta Storage Program was suspended in July 2006 when state funding was terminated (See Appendix B. Summary of the In-Delta Storage Program).

Active CALFED surface storage investigations are evaluating potential projects' abilities to meet needs related to droughts, floods, emergencies, and climate change, and improvements to water quality and aquatic and riparian ecosystems, hydropower generation, and recreation. The investigations are also evaluating how potential new surface water storage projects can supplement the storage capacity and add more flexibility to the state's strained water system, and contribute to the California Water Plan's goal for long-term, sustainable water resources use that enhances our environment, our economy, and our communities (See Appendix C. California Water Plan – Integrated Water Management Framework). The Department of Water Resources (DWR), the US Department of the Interior Bureau of Reclamation (Reclamation), and other CALFED agencies continue to participate in these feasibility study investigations (See Figure 1-1):

- **NODOS Investigation** – DWR and Reclamation are working in partnership with local, regional, state, and federal agencies, and stakeholders to formulate offstream surface storage opportunities in the Sacramento Valley.
- **USJRBSI** – Reclamation and DWR are working in partnership with local, regional, state, and federal agencies, and stakeholders to formulate and evaluate alternatives to develop water supplies in the upper San Joaquin River watershed for multiple purposes.
- **LVE Investigation** – DWR, Reclamation, and the Contra Costa Water District (CCWD) are collaborating with local, state, and federal agencies and stakeholders on the formulation and development of Los Vaqueros enlargement opportunities.
- **SLWRI** – Reclamation is leading the investigation for potential raises of Shasta Dam to enlarge Shasta Lake in consultation with DWR<sup>1</sup>, concerned agencies, and stakeholders to evaluate opportunities to improve water supply and reliability for environmental, agricultural, and urban uses.



**Figure 1-1. Location of Potential Surface Storage Projects**

<sup>1</sup> State law, California Public Resources Code 5093.542(c), restricts state involvement in the Shasta Lake Water Resources Investigation feasibility study.

Study management teams for the investigations are jointly following an iterative planning process consistent with the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (WRC, 1983). The guidance lays out a study process that first defines problems, needs, and opportunities to support the development of planning objectives and constraints. Then potential solutions are formulated into alternatives by defining management measures and combining them to develop initial alternative plans. The results of the initial phases of each surface storage investigation are documented in project-specific planning reports, such as Initial Alternatives Information Reports (IAIR) and Plan Formulation Reports (PFR). The initial alternative plans ultimately will be refined, evaluated, and documented in the Feasibility Reports and National Environmental Policy Act (NEPA) / California Environmental Quality Act (CEQA) environmental documents to support decision-making by responsible federal, state, and local entities.

The most recent documents for the storage investigations are:

- NODOS Plan Formulation Report, September 2008
- USJRBSI Plan Formulation Report, October 2008
- SLWRI Plan Formulation Report, December 2007
- LVE Draft Environmental Impact Statement/Environmental Impact Report, February 2009
- LVE Final Environmental Impact Statement/Environmental Impact Report for a 60,000 acre-foot enlargement of Los Vaqueros Reservoir, March 2010

Since the release of these interim planning documents, water management, biological, political, hydrologic, and regulatory conditions have changed substantially in the Delta. Such new conditions include 2008/2009 Biological Opinions (BO) for Delta smelt and salmon, Delta pumping constraints, the 2009 Comprehensive Water Package, Bay-Delta Conservation Plan (BDCP) and Delta Habitat Conservation and Conveyance Program (DHCCP) planning and decisions, climate change impacts and adaptation strategies, and sea level rise estimates. There are substantially greater water management challenges in California now than when these feasibility studies were initiated. These challenges and stressors, which are discussed further in Chapter 2, are being considered and incorporated into the surface storage investigations. Additionally, the 2009 Comprehensive Water Package will affect the feasibility studies and the implementation of potential surface storage projects in several ways, such as new planning and coordination for the Delta (e.g., the Delta Plan); the development of flow criteria for the Delta, targets for water use efficiency, and guidelines for determining the economic benefits of projects; and a bond measure that would include funding for public benefits associated with potential storage projects.

These changing conditions, assumptions, Delta planning efforts, and emerging legislation and initiatives have affected the scopes and timelines for the surface storage investigations. For example, analysis conducted for this report includes operations assumptions based on the recent BOs on salmon and Delta smelt (although final systems operations are still being worked out), whereas the analysis contained in the IAIRs and PFRs is based on the 2004/2005 Operations Criteria and Plan. With the exception of the LVE Investigation, the draft Feasibility Reports and draft NEPA/CEQA compliant EIS/EIRs for the investigations may be completed in late 2011. A final EIS/EIR for a 60,000 acre-foot enlargement of Los Vaqueros Reservoir was published in March 2010.

## Purpose and Scope of Report

The purpose of this Progress Report is to provide information on the status of the ongoing CALFED surface storage investigations, including the NODOS Investigation, USJRBSI, LVE Investigation, and SLWRI. This report summarizes the status of the studies and potential benefits and effects of example project formulations. The report includes new analyses of potential project formulations and discussion of how the projects fit within current state, federal, and regional water management and Delta initiatives (e.g., BDCP, DHCCP, and the Delta Plan) as part of comprehensive statewide and regional water management solutions. For this report, new analysis was conducted on how potential projects could be operated under new conditions, which are inclusive of the 2008/2009 BOs, and an estimate of potential project benefits was made. This report also provides new preliminary analysis on how benefits of potential projects would be affected by Delta conveyance measures being considered by BDCP/DHCCP and climate change. Finally, this report describes the next steps for the feasibility studies and environmental documentation as required by CEQA and NEPA, and discusses how these steps and processes are affected by the 2009 Comprehensive Water Package.

For each investigation, several different project alternatives are being evaluated as part of the planning, environmental review, and documentation process. For the purposes of this report, one conceptual surface storage project formulation (a package of physical facilities, environmental measures, and operations) is presented for each investigation. This Progress Report is not intended to designate or select any particular project alternative for implementation.

The analyses conducted for this report included an evaluation of potential project benefits with new conveyance in the Delta. BDCP and DHCCP are currently studying the potential of various alternatives for new Delta conveyance but the results of these analyses are not complete at this time. Therefore, analyses for this Progress Report include an example isolated facility in the Delta (hereafter, new Delta conveyance) (See Figure 1-2). The assumptions for the new Delta conveyance facilities were consistent with the October 2009 Draft Bay Delta Conservation Plan (The new Delta conveyance facilities modeled for this report do not designate or preclude selection of a preferred project under BDCP/DHCCP. The assumed facilities provided a sufficiently detailed representation of a potential conveyance configuration for modeling purposes).

DWR consulted with Reclamation and CCWD in the preparation of this report. DWR is a partner with Reclamation in the study of NODOS and USJRBSI, and with Reclamation and CCWD in the LVE Investigation. State legislation limits DWR's participation in the SLWRI; however, DWR does coordinate and review feasibility study reports and environmental documentation developed for the SLWRI. The information for SLWRI presented in this report is summarized from previous Reclamation documents and from operations studies conducted by Reclamation.

This report is not a decision document and is separate from the ongoing feasibility studies and NEPA/CEQA compliance documentation for the surface storage investigations. This report does not include detailed economic or design analysis, comparison of projects, or allocation of project benefits, nor does it provide sufficient information to make determinations on preferred alternatives.

This report provides up-to-date information available at the time this report was drafted. New analyses conducted for this report are for informational purposes only.

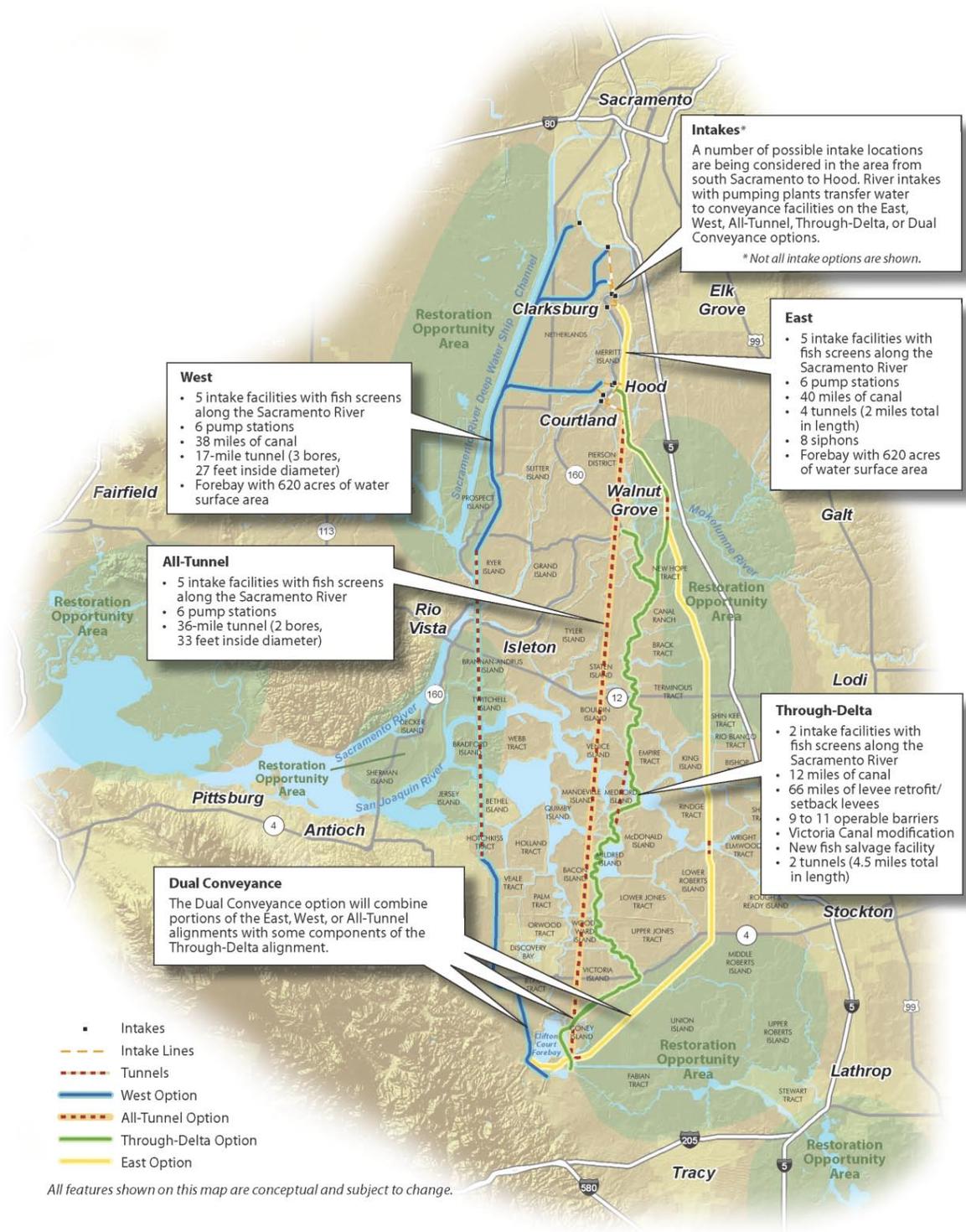


Figure 1-2. Potential Configurations of New Delta Conveyance

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## Report Organization

This Progress Report is organized by the following chapters:

- **Introduction** – This chapter provides the background information on water management in the state and the surface storage programs and the purpose and scope of the report.
- **Major Water Management Challenges in California** – This chapter describes the major challenges to managing water resources in the state, such as declining ecosystems, drought, water quality, climate change, flood risk, population growth, and a changing Delta.
- **North-of-the-Delta Offstream Storage Investigation** – This chapter summarizes the NODOS investigation feasibility study and presents new information on how changes to physical, biological, and regulatory conditions affect regional and statewide project benefits.
- **Upper San Joaquin River Basin Storage Investigation** – This chapter is similar to the previously described NODOS chapter, but is specific to the USJRBSI.
- **Los Vaqueros Expansion Investigation**– This chapter is similar to the previously described NODOS chapter, but is specific to the LVE Investigation.
- **Shasta Lake Water Resources Investigation** – This chapter is similar to the previously described NODOS chapter, but is specific to the SLWRI.
- **Summary and Next Steps** – This chapter provides a brief summary of the report and a discussion of the next steps in the feasibility studies for the surface storage investigations, including new steps stemming from the 2009 Comprehensive Water Package.

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