MARCH 18, 2011
SECOND STAFF DRAFT DELTA PLAN

This is the second of four (4) staff draft versions of the Delta Plan that will be presented to the Delta Stewardship Council (Council) prior to the release of the Draft Environmental Impact Report (EIR) by mid-June 2011. The staff draft versions will be released in the following order.

- **February 2011:** First Staff Draft Delta Plan was posted on February 14, 2011 and discussed at Council meetings on February 24 and 25, 2011 and March 10 and 11, 2011.
- **March 2011:** Second Staff Draft Delta Plan to be posted on March 18, 2011 and discussed at Council meetings on March 24 and 25, 2011 and April 14 and 15, 2011.
- **April 2011:** Third Staff Draft Delta Plan.
- **May 2011:** Fourth Staff Draft Delta Plan (for modification and approval by the Council to be circulated with the Draft EIR).
- **June 2011:** Draft Delta Plan and Draft EIR are circulated.

After circulation of the Draft EIR, comments obtained on the Draft Delta Plan and Draft EIR will be considered. Council staff will prepare written responses to comments received on the Draft EIR; those responses will become part of the Final EIR. The Delta Plan will be finalized in light of the comments and Final EIR. In November 2011, the Council will consider the Final EIR for certification under CEQA, then consider the final Delta Plan for adoption.

At each stage of the development of the Staff Draft Delta Plan there will be public meetings at the Council meetings for the purpose of receiving information and comments and for Council deliberation. All Council meetings are public and simulcast on the Council website at www.deltacouncil.ca.gov.

In addition, public comments are welcome during the entire process and will become a formal part of the record. The Council encourages written public comments to be submitted to deltaplancomment@deltacouncil.ca.gov. **All comments received by Friday, April 15, 2011**, will be considered for revisions made in developing the Third Staff Draft Plan. All comments received are posted to the Delta Stewardship Council web site: http://www.deltacouncil.ca.gov/

RELEVANT POINTS TO THE MARCH 18, 2011 SECOND STAFF DRAFT DELTA PLAN

- Executive Summary, Chapter 10, and Performance Measures and Targets in Chapters 4 through 8 are under development and not included in the Second Staff Draft Delta Plan.
- Findings in Chapters 4 through 8 were provided in the First Staff Draft Delta Plan. These Findings are under review by the Independent Science Board and Council staff and are not included in the Second Staff Draft Delta Plan. It is anticipated that the previously published Findings will be modified substantially.
- Graphics are under development and not included in the Second Staff Draft Delta Plan.
- Technical editing for all information in the Staff Draft Delta Plan versions, including fact-checking, grammatical, and style changes, and inclusion of additional citations and references will be ongoing.

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Chapter 1
The Delta Plan

The Delta Stewardship Council was established as an independent State agency, effective February 3, 2010, by the Sacramento San Joaquin Delta Reform Act of 2009 (new Div. 35 of the Water Code, added by SBX7 1, Ch. 5, Stats/ 09-10, 7th Ex. Session).

The primary responsibility of the Council is to develop, adopt, and implement by January 1, 2012, a legally-enforceable, comprehensive, long term management plan for the Delta—the Delta Plan—that achieves the coequal goals of "providing a more reliable water supply for California and protecting, restoring and enhancing the Delta ecosystem" and does this "in a manner that protects and enhances the unique cultural, recreational, natural resource and agricultural values of the Delta as an evolving place" (Water Code section 85054).

The coequal goals form the core organizational framework for the Delta Plan. The policy of State is "to achieve the following objectives that the Legislature declares are inherent in the coequal goals for the management of the Delta:

> *(a) Manage the Delta's water and environmental resources and the water resources of the state over the long term.*
>
> *(b) Protect and enhance the unique cultural, recreational, and agricultural values of the California Delta as an evolving place.*
>
> *(c) Restore the Delta ecosystem, including its fisheries and wildlife, as the heart of a healthy estuary and wetland ecosystem.*
>
> *(d) Promote statewide water conservation, water use efficiency, and sustainable water use.*
>
> *(e) Improve water quality to protect human health and the environment consistent with achieving water quality objectives in the Delta.*
>
> *(f) Improve the water conveyance system and expand statewide water storage.*
>
> *(g) Reduce risks to people, property, and state interests in the Delta by effective emergency preparedness, appropriate land uses, and investments in flood protection.*
>
> *(h) Establish a new governance structure with the authority, responsibility, accountability, scientific support, and adequate and secure funding to achieve these objectives (Water Code section 85020 et. seq.).*

It is also the policy of the State "to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on the water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced

water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts" (Water Code section 85021).

The 2012 Delta Plan marks the beginning of the most significant water and ecosystem planning and implementation effort to be undertaken in the state's history. The Delta Plan will put into place the regulatory policies and recommendations to help achieve a restored estuary for the state's diverse fish and wildlife populations and a more reliable water supply on which future generations of Californians will depend.

Achieving the coequal goals and inherent objectives will be a complicated and lengthy undertaking. It will require an unprecedented level of coordination and cooperation among state, federal, and local governments as well as all residents of California.

The 2012 Delta Plan lays out the initial roadmap for how to achieve the coequal goals and inherent objectives over the next century. The Plan specifies the regulatory policies and recommendations that will guide implementation of the Delta Plan over the next five years and beyond.

Current Conditions: California's Delta and Its Water Delivery Infrastructure Are in Crisis

As recognized by the California Legislature, the state's Delta is "a distinct and valuable natural resource of vital and enduring interest to all the people" (Water Code section 85022(c)(1)). The Delta is the largest estuary on the west coast of North and South America and provides habitat for 55 species of fish and over 750 species of plants, birds, and wildlife.

Over a century ago, the development in the Delta of an intricate, non-engineered levee system to channel water and reclaim land yielded thousands of acres of fertile agricultural land. However, the communities that have since evolved behind those levees face the constant threat of flooding, and in some cases catastrophic flooding. The Legislature declared the Delta "inherently floodprone" in 1992 (Public Resources Code section 29704).

The Delta's rivers and miles of natural and man-made sloughs and channels are also the linchpin to how water supplies are moved from northern California to Central and Southern California. State and federal water projects were built in the Delta during the early and middle decades of the 20th century. In order to provide water for these projects, a system of upstream reservoirs was built to divert and release water to eventually flow to and through the Delta to the State Water Project and Central Valley Project pumping and conveyance facilities. Currently nearly two-thirds of the state's population depends upon the Delta and these conveyance facilities for some portion of their water supply as does more than two million acres of highly productive farmland (Water Code section 85004(a)).

Today, the valued elements of the Delta ecosystem are, by almost any measure, in serious decline. Reduced and variable freshwater inflows to the Delta, increasing pressure for water exports, impacts of water pumping facilities, invasive species, urban growth, and urban and agricultural pollution are degrading water quality and threatening the survival of multiple native fish species.

The reliability of water supplies from the Delta has also begun to deteriorate, at the same time that the dependence of the economies of major regions of the state on these supplies has grown. Regulatory and court-imposed constraints on Delta water system operations are increasing as native fish populations decline, reducing the reliability of water deliveries, impacting urban and agricultural water users, and threatening the economic vitality of the state.

Significant obstacles exist to achieving statewide water supply reliability. California's water managers don't know how much water is being used an annual basis. The State Water Resources Control Board has issued permits for diversion of water from the Delta, but total actual diversion amounts are currently unknown. Owners and operators of nearly one-third of irrigated lands in the Delta watershed do not participate in programs to meet water quality standards, and may not be complying with the state Water Code. Groundwater monitoring is inadequate, and the state regulates groundwater and surface water separately even though they are part of an interconnected system.

Adding to these problems is the increasing volatility of the Delta's water supplies due to climate change, including shifting precipitation and runoff patterns. The potential for catastrophic failure in the Delta and the risk to its residents and water delivery infrastructure due to floods, sea level rise, and land subsidence is painfully real and growing.

As recognized by the California Legislature, the situation that faces the Delta and California is unsustainable (Water Code section 85001(a)). Collectively, the risks to people, property, and the statewide interests in the Delta have grown to unacceptable levels.

The Delta Reform Act of 2009 was passed by the Legislature "to provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem, to provide for a more reliable water supply for the state, to protect and enhance the quality of water supply from the delta, and to establish a governance structure that will direct efforts across state agencies to develop a legally enforceable Delta Plan" (Water Code section 85001(c)).

The Vision for What the Delta Plan Will Achieve by 2100

The Delta Plan must achieve the coequal goals and inherent objectives in the face of dramatically changing conditions. Over the next 90 years, California's population will grow. The Delta's ecosystem will alter substantively. Climate change and sea level rise will intensify the Delta's ecological, flood control, water quality and water supply reliability challenges. There are many changes—some foreseeable and some not—to which the Plan will need to adapt.

Restoring the Delta and providing a more reliable water supply will require a broad range of linked actions, most of which will need to be developed over time. The policy regulations and recommendations made in the 2012 Delta Plan lay the foundation for work over the decades to come. The guiding vision—the achievement of the coequal goals and inherent objectives—is intended to result in the following outcomes by 2100:

- The coequal goals of restoring the Delta ecosystem and providing a more reliable water supply for California must be the foundation of all state water management policies. No water rights decisions will be made in the Delta or elsewhere in the state without consideration of both ecological and water reliability impacts. The Public Trust Doctrine and California's Constitutional Article 10, Section 2, requirements for beneficial use, reasonable water use, and no waste will be fully enforced. California will have a fully integrated, real time system for tracking and evaluating water use and water quality for both surface water and groundwater supplies.

- The Delta will be restored as the heart of a healthy estuary while the Delta watershed remains central to water supplies for the state. A diverse mosaic of interconnected habitats—tidal marshes, floodplains, seasonal grasslands, and areas of open water—will be re-established within the Delta and its watershed. Migratory corridors for fish, birds, and other wildlife will be restored. Because actions will be taken to ensure that sufficient freshwater flows that follow a more natural

hydrograph are dedicated to support a healthy ecosystem as well as to reduce impacts caused by invasive species, poor water quality, loss of habitat, and inappropriate urban development, native species of fish, birds, and wildlife that depend on the Delta and its watershed will be thriving.

- California will lead the nation in water efficiency and sustainable water use. Urban, residential, industrial, and agricultural water efficiency improvements will result in reduced per capita water use by 50 percent or more statewide. Regions of California that previously had severe groundwater overdraft conditions will sustainably manage these water resources. Because significant new local and regional water supplies—recycled water, storm water, desalinated water and reclaimed impaired groundwater—will be developed and implemented through integrated regional water management plans, California will be less dependent on water supply from the Delta, and will be able to withstand extended droughts and imported water interruptions, as well as cope with climate change impacts, without severe disruptions to the state's economy or environment.

- The Delta will remain a distinctive and culturally significant region. Visitors from around the world will be drawn to the Delta for recreation and to experience its beauty and ecosystem. Because state, federal and local agencies will take actions to prepare for future changes caused by sea level rise, earthquakes, floods and other natural forces, land use policies and levee improvements will be adopted to ensure that people, property and statewide interests in the Delta will be protected. Progress in achieving the coequal goals will provide a strong foundation for protecting and enhancing the unique resource and cultural values of the Delta as an evolving place for the next century.

- California's water conveyance and storage facilities in the Delta watershed will be significantly improved and better linked. Because Delta improvements will be constructed to increase resilience, water management flexibility and water quality, water will be exported from the Delta in a manner that is less harmful to the ecosystem. Surface supplies and groundwater will be managed in an integrated and sustainable manner.

Geographic Scope and Use of the Delta Plan

The scope of the Delta Plan encompasses the Delta and Suisun Marsh, the Delta watershed and areas of the state that use water from the Delta watershed, as shown in Figure 1-1. The Primary Planning area includes the statutory Delta (as defined by the Delta Protection Action of 1992) and the Suisun Marsh. For the purposes of the Plan, the Delta and the Suisun Marsh are collectively referred to as the "Delta", unless otherwise specified.

The Second Planning Area includes the Delta watershed, the Upper Trinity River Watershed, and areas outside of the Delta in which exported water is used. In setting these boundaries, the Delta Stewardship Council recognized that the Delta Reform Act requires that the Delta Plan address certain statewide water issues that are vital to sustainable management of the Delta (see, for example, Water Code sections 85020(a),(d),(f), and (h) 85302(b), 85303, 85304 and 85307 (a)).

The Delta Plan will become a set of integrated and legally enforceable regulatory policies that are the basis for findings of consistency by local and state agencies for proposed plans, programs and projects that meet the definition of a "covered action" (Water Code 85300(a)). In addition, the Delta Plan policy recommendations will provide the basis for the Council to provide advice to state, federal, and local agencies and to take other actions on issues relating to the achievement of the coequal goals.

Figure 1-1
Delta Plan Study Area

Therefore, the Delta Plan contains both "policies", which are mandatory and "recommendations" that are discretionary. Covered actions must be consistent with the plan's regulatory policies. Covered actions are defined as:

> *"...a plan, program or project as defined pursuant to Section 20165 of the Public Resources Code that meets all of the following conditions:*
>
> 1. *Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh;*
> 2. *Will be carried out, approved, or funded by the state or a local public agency;*
> 3. *Is covered by one or more provisions of the Delta Plan;*
> 4. *Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta."* (Water Code section 85057.5)

Certain actions are exempted from the definition of "covered action", including a regulatory action of a state agency, and routine maintenance and operation of the State Water Project or the federal Central Valley Project (Water Code section 85057(b)).

State or local agencies that propose to undertake covered actions are required to certify with the Council, prior to initiating implementation, that these proposed plans, programs, or projects are consistent with the Delta Plan (Water Code section 85225 et. seq.). If an appeal is made, the Council is responsible for subsequent evaluation and determination, as provided in statute and the Council's Procedures Governing Appeals of whether the proposed covered actions are consistent with the Delta Plan.

When a covered action has a connection to an out-of Delta action(s), the covered action's proponent must include an evaluation of (1) whether the out-of-Delta action(s) significantly contributes to the need for the covered action and, if so, (2) whether the out-of-Delta action(s) is consistent with the Delta Plan's regulatory policies. When an "out-of-Delta" proposed action has no connection with a covered action, the Council strongly recommends that the action be consistent with the Delta Plan, but compliance with the Plan's regulatory policies is discretionary.

Chapter 3, Governance Plan to Support Coequal Goals, provides further description of the process that the Council will follow in making consistency findings and determinations. The Council adopted administrative procedures governing appeals of consistency determinations on September 23, 2010.

Use of Adaptive Management in the Delta Plan

The Delta Stewardship Council is required by law to use the best available science as the basis for the Delta Plan. The Delta Plan must include "a science-based, transparent, and formal adaptive management strategy for ongoing ecosystem restoration and water management decisions" (Water Code section 85308(f)).

Scientific understanding of the Delta and California's water conditions is constantly changing. Delta-related resource management decisions must often be made with incomplete information. Adaptive management provides the necessary flexibility and feedback to manage complex natural resources in the face of considerable uncertainty about the effectiveness of specific management actions.

The Council is required to review the Delta Plan at least once every five years and may revise the Plan as the Council deems appropriate (Water Code section 85300(c)). Chapter 2, Science and Adaptive Management for a Changing Delta, outlines the adaptive management framework that will be used to guide the development and subsequent revisions of the Delta Plan.

In addition, unless adaptive management concepts are inapplicable, all proposed covered actions will be required to adhere to the adaptive management framework described in Chapter 2. Proponents of proposed covered actions must describe how they intend to apply the adaptive management framework, including a commitment for communicating to the public the information learned during the monitoring and assessment of implemented actions. The Council will use the improved understanding gathered through the implementation of Delta Plan covered actions and associated research to revise the Plan.

Inclusion of Other Plans in the Delta Plan

By statute, the Delta Stewardship Council may incorporate part or all of other plans related to the Delta if the Council determines that these plans will assist with the achievement of the coequal goals (Water Code section 85350).

The Council recognizes that several important planning efforts relating to the Delta are not, or may not, be completed prior to the January 1, 2012 deadline for Council adoption and implementation of the Delta Plan. The Council has reviewed the available information to determine whether these plans, in part or in whole, may be included in the Delta Plan. Further, the Council can elect at a future time to include a final plan or to incorporate new information into the Delta Plan (Water Code section 85300(c)).

The Delta Reform Act explicitly references the incorporation of the Bay Delta Conservation Plan (BDCP) in the Delta Plan if the BDCP meets the requirements of Water Code section 85320, including the approval by the Department of Fish and Game of the BDCP as a natural community conservation plan and its approval as a habitat conservation plan pursuant to the federal Endangered Species Act.

By statute, the determination by the Department of Fish and Game that the BDCP has met the requirements of Water Code section 85320 may be appealed to the Council. If the Council finds that the BDCP fails to meet the statutory criteria, then "...the BDCP shall not be incorporated into the Delta Plan and the public benefits associated with the BDCP shall not be eligible for state funding" (Water Code section 85320(b)).

The Council has determined that any consideration or use of BDCP related studies or concepts in the Delta Plan will not have a pre-decisional effect on any possible future appeal of a Department of Fish and Game determination related to the BDCP. As required by statute, the Council will base its review of any appeal on the complete record before it, consistent with Water Code section 85320(e) and the Council's adopted appellate procedures.

Phasing of the Delta Plan and the First Five Years

Over the next 90 years, the Delta Plan will be developed in phases, consistent with the principles of adaptive management and availability of new and improved information. By statute, the Delta Stewardship Council must review the Delta Plan every five years, but may adopt revisions to the Delta Plan whenever the Council deems appropriate (Water Code section 85300(c)).

The Plan identifies key milestones dates for the Council to evaluate the performance of the Delta Plan and the progress in achieving the coequal goals: These milestones are:

- **2025 (Near Term):** The timeframe in which the BDCP is scheduled for implementation, many of the Delta levees and associated structures will be approaching 150 years of age (although many structures will have undergone substantial repairs), and sea level rise of approximately 6-inches is projected to occur;

- **2050 (Mid Century):** The timeframe by which the water supply contracts for the State Water Project and Central Valley Project will be renewed, many of the Central Valley Project reservoirs

will be approaching 100 years of age, and sea level rise of approximately 18- to 24-inches is projected to occur; and

- **2100 (Long Term):** The timeframe by which much of the infrastructure within the Delta will be 150- to over 200-years old (although many structures will have undergone substantial repairs) and sea level rise of more than 55-inches is projected to occur.

The initial five years after adoption of the Delta Plan will be critical to its success. Unfortunately, vital sources of information, including the BDCP, Delta water flow standards, and improved water use data will not be available prior to the Council's adoption of the Delta Plan.

Accordingly, the Council has determined that the first step towards achieving the coequal goals is to halt, to the extent feasible, new or additional practices and activities within the Delta or that have an impact on the Delta which:

- Further erode water supply reliability or water quality;
- Degrade the Delta ecosystem; or
- Increase risk to people, property or statewide interests.

In addition, the Delta Plan identifies opportunities for actions that will contribute to enhanced water reliability, help restore the Delta ecosystem, and improve the collection of water use data and other information that will guide the next Delta Plan update.

Organization of the Delta Plan

This section is under development.

Chapter 2
Science and Adaptive Management for a Changing Delta

Statute requires that the Delta Plan shall "Include a science-based, transparent, and formal adaptive management strategy for ongoing ecosystem restoration and water management decisions" (Water Code section 85308(f)). Adaptive management as defined in statute means "a framework and flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation leading to continuous improvements in management planning and implementation of a project to achieve specified objectives" (Water Code section 85052). Adaptive management is not currently being used to its fullest extent in the Delta, but the intent of the Delta Plan is to more effectively use adaptive management for planning, implementing, and decision making related to actions that affect Delta ecology, water operations, and social networks.

The adaptive management approach provides a formal process that allows for making decisions on the basis of best available science, closely monitoring and evaluating outcomes, and reevaluating and adjusting decisions once more information is learned. Adaptive management is smart management—it provides the necessary flexibility and feedback to manage natural resources in the face of often considerable uncertainty about management effects. Adaptive management closely integrates policy, management and science in an ongoing, clearly structured, transparent, timely, and inclusive cycle.

The Council will use this adaptive management framework to review and revise the Delta Plan. In addition, all proposed covered actions will be required to adhere to this adaptive management framework. Proponents of proposed actions must describe how the adaptive management framework will be applied, including a commitment for communicating to the public information learned from the monitoring and assessment of implemented actions.

Adaptive Management and the Delta

The Delta and our understanding of the Delta are constantly undergoing change (e.g. Healey et al. 2008, Lund et al. 2010). Delta-related resource management decisions are often made without perfect information. Adaptive management is one approach that is appropriate for managing the Delta because adaptive management embraces uncertainty, monitors actions, evaluates outputs and outcomes, and revises policy decisions based on improved understanding (Christensen et al. 1996, Abal et al. 2005). Ideally, effective adaptive management for the Delta will derive from excellent science linked to governance that allows adjustments and changes to management decisions in a timely and transparent manner.

Proposed covered actions in the Delta should allow and plan for adaptive management of the Delta as a changing place. Adaptive management is an approach to resource management that is applied to systems that constantly undergo change. It is based on the science of learning by doing, embracing uncertainty,

monitoring actions, evaluating outputs and outcomes, and revising policy decisions based on improved understanding (Christensen et al. 1996, Abal et al. 2005, Healey et al. 2008). It is the policy of the Council that Delta-related plans, programs and projects that meet the definition of "covered action" (Water Code section 85057.5) shall clearly describe the use of adaptive management in planning, implementation, and decision making, unless adaptive management concepts are not applicable based on the nature of the covered action. This chapter presents a framework for the application of adaptive management to proposed plans, programs, and projects. The review process and governance structure to support adaptive management are described in Chapter 3.

An Adaptive Management Framework

Several suggested frameworks for adaptive management have been developed elsewhere and provide the basis for the adaptive management approach for the Delta Plan (Christensen et al. 1996, Stanford and Poole 1996, CALFED Bay-Delta Program 2000, Habron 2003, Abal et al. 2005, Healey 2008, Kaplan and Norton 2008, BDCP Independent Science Advisors on Adaptive Management 2009, Williams et al. 2009). While there are some differences among various frameworks, they generally contain three broad phases: plan, implement, and decide.

1. Planning is the first phase of the adaptive management framework and includes:

   a) define/redefine the problem (findings);

   b) establish goals, objectives, and performance measures;

   c) model linkages between objectives and proposed action(s);

   d) select action(s): research, pilot and full-scale; and

   e) design implementation action(s) with monitoring.

2. Implementing is the next phase of adaptive management, and includes:

   a) implement action(s) and monitoring;

   b) analyze, synthesize, and evaluate; and

   c) communicate current understanding (this step spans the implement and decide phases of adaptive management).

3. Deciding what to do is the final phase and basically includes:

   a) respond/adapt.

The Council will use the adaptive management framework in Figure 2-1 as a guideline for revising the Delta Plan and evaluating the use of adaptive management in proposed covered actions. This framework and the description of each step are largely derived from Stanford and Poole (1996), Abal et al. (2005), CALFED Bay-Delta Program (2000), and the BDCP Independent Science Advisors on Adaptive Management (2009).

1. Plan

The "plan" part of the adaptive management framework is presented as five steps. The Act provides the core elements for the first step, defining the overall problem and providing broad findings. The Act also establishes components of the second step, including notably, the coequal goals, and objectives.

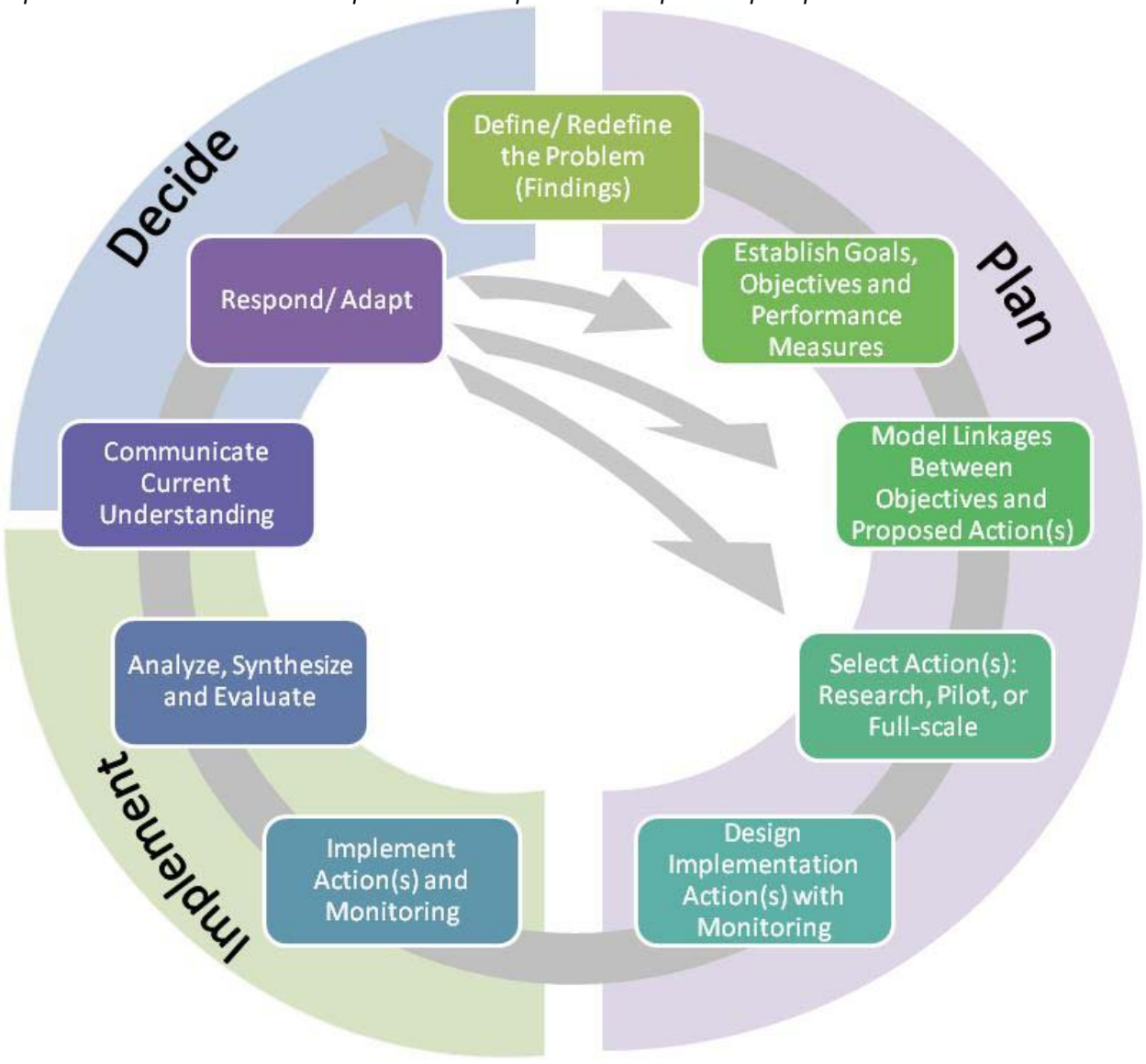
Define/Redefine the Problem (Findings)

The first step of effective adaptive management is to clearly define the problems that will be addressed. This may take the form of a finding or problem statement clearly linking to program goals and to specific objectives, which were developed by proponents in an open and transparent manner. All problem statements must be based on the best available science and clearly documented information. Defining a problem commonly requires defining the boundaries of the problem (e.g. the geographic scale, temporal scale, and ecological processes).

Figure 2-1

An Adaptive Management Framework for the Delta Plan.

The shading represents the three broad phases of adaptive management (Plan, Implement and Decide) and the boxes represent the steps within an adaptive management framework. The circular arrow represents the general sequence of steps. The additional arrows indicate possible next steps from the respond/adapt step.



Establish Goals, Objectives, and Performance Measures

Clear goals, objectives, and performance measures must be established by proponents, and be based on the best available science. Goals are broad statements that propose general solutions. Objectives are more specific than goals, and are often quantitative, specific statements of desired outcomes allowing evaluation and performance measurement. A performance measure is qualitative or quantitative information that tracks progress in meeting objectives and derives from a strong monitoring design.

Model Linkages between Objectives and Proposed Action(s)

Models formalize and apply current scientific understanding, develop expectations, assess the likelihood of success, and identify tradeoffs associated with different management actions. Models can be conceptual, statistical, or physical. Models link the objectives to the proposed actions in order to clarify why the intended action is expected to result in meeting its objectives. Both qualitative (conceptual) and quantitative models can effectively link objectives and proposed actions by illuminating if and how different actions meet specific objectives. Conceptual models in particular are very useful for both decision makers, scientists, and the public because they provide a mental illustration about the most critical cause-and-effect pathways, providing an articulation of how various actions might achieve particular objectives. Conceptual models should be used within adaptive management planning because they help explain how other types of models, research, and actions will be used to explore hypotheses and address specific uncertainties.

Select & Evaluate Action(s): Research, Pilot, Full-scale

The process for selecting and evaluating an action or suite of actions to meet objectives and performance measures includes an evaluation of the best available science and the developed conceptual model. This evaluation should inform the level of the action(s) to be taken (e.g. further research, pilot-scale project or full-scale projects), the physical and temporal scale of the action(s), the degree of confidence in its benefits, and the consequences of being wrong. This step should be performed by technical staff, such as scientists, engineers, land and water managers, and other project participants.

Design Implementation Action(s) with Monitoring

The design of implementation action(s) with associated monitoring includes clearly describing specific activities that will occur under that action(s). Design implementation includes a plan for both implementation of the action(s) and monitoring responses from the action(s). This design step includes identifying adequate funding to carry out both the action(s) and the associated monitoring for the appropriate implementation period. Well designed data management should also occur in this step as data management is critical for analyses, synthesis, and evaluations. Well designed data management also should include a plan for organized and clearly documented observations regarding how data are collected, the methods and calculations used, the time and space scales of the variables, and accurate site locations and characteristics.

The design of monitoring goes beyond data collection and data management. Monitoring includes targeted research to answer why certain results are observed and others are not. Monitoring also includes clear communication of the information gathered and current understanding drawn from this information. This monitoring includes compliance monitoring (e.g. required by permits), performance monitoring (e.g. measuring achievement of targets), mechanistic monitoring (e.g. testing the understanding of linkages in the conceptual model), and system-level monitoring (e.g. holistic and long-term). These types of monitoring can measure and communicate various types of information; for example, administrative/inputs (e.g. dollars awarded and spent, projects funded, etc.), compliance/outputs (e.g. tons of gravel added, acres exposed to tidal action, etc.) and effectiveness/outcomes (e.g. actual outcome expected from implementing an action at the local scale, suites of actions at the system-wide scales and status and trends assessments). Within the monitoring design, an integrated suite of monitoring metrics

must be developed that can be integrated and summarized to inform decision makers and the public as described in the Communicate Current Understanding step.

2. Implement

The "implement" portion of adaptive management includes three steps.

Implement Action(s) and Monitoring

Implementation of actions and monitoring programs should occur in parallel. However, before an action is implemented initial conditions should be clearly documented so that a baseline is established. The implementation of action(s) and monitoring should be executed in a transparent manner and clearly communicated to the public. Status and trends metrics after implementation compared to these same measures in areas where implemented actions have not occurred are often good assessment tools.

Analyze, Synthesize and Evaluate

Analysis, synthesis, and evaluation of the action(s) and monitoring are critical for improving current understanding. Analysis and synthesis should be informative of how conditions have changed, both expected and unexpected, as a result of the implementation of the action(s). The evaluation should examine whether or not one or more of the performance measures have been met as a result of the implemented action(s) and why. If a performance measure is not met, an explanation of the potential reasons why this measurement has not been met should be clearly identified and communicated. The results of the analysis, synthesis, and evaluation step could be published in technical, peer-reviewed reports for the purpose of external review, transparency and accessibility where results warrant this level of communication.

Communicate Current Understanding

Communication of current understanding gained through analysis, synthesis, and evaluation of implemented action(s) and monitoring is a key step for educating and equipping policy makers, managers, stakeholders, and the public to appropriately respond and adapt. This step spans both the "implement" and the "decide" areas of adaptive management because the communication of current understanding and related recommendations for change requires both policy and technical expertise. The information communicated should be technically sound, well synthesized, and translated into formats conducive to informing a non-technical audience (e.g. a report card) and should be disseminated to those directly involved in the adaptive management process for the plan, program or project and to those interested in the outcome of the action.

Technical staff and decision makers should be regularly involved in the exchange of information as data are analyzed and synthesized. Communication should be ongoing and occur at appropriate time scales for which an improved understanding could lead to refining other steps of the adaptive management framework. Key to successful communication is a skilled and dedicated interdisciplinary person or team that understands the technical information learned and the functional needs of the decision makers.

3. Decide

The "decide" area of adaptive management includes one key step, the respond/adapt step. Under the Act, formal decision making is the responsibility of the Council and all other processes should be structured to provide strong support for Council decisions.

Respond/Adapt

Proponents need to be engaged and prepared to respond and adapt to a change in current understanding. Educated and equipped with new results and understanding, decision makers should reexamine the other

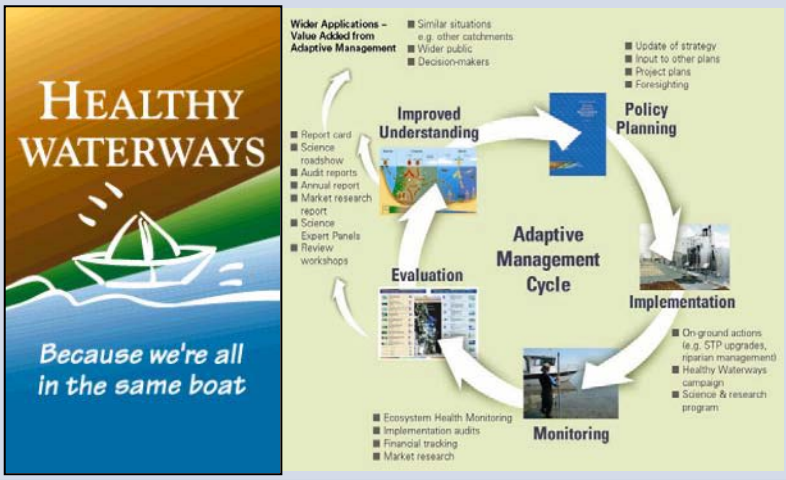
steps of the adaptive management framework and adapt where current understanding suggests doing so. Possible next steps could include redefining the problem; amending goals, objectives, and performance measures; altering the conceptual model; or selecting an alternative action for design and implementation.

Summary

The Council will use the adaptive management framework in this chapter, and other provisions of the Delta Plan and Council rules and procedures as appropriate to make decisions on covered actions and revising the Delta Plan. Flexible and responsive governance to support adaptive management is essential to achieve the coequal goals and is further discussed in Chapter 3.

Box 1- Healthy Waterways Initiative in South East Queensland

•In South East Queensland, Australia, the Healthy Waterways Initiative was designed and implemented to improve the health of regional waterways and catchments including the ecosystems supporting the livelihoods and lifestyles of the people in this rapidly growing part of Australia. The initiative's collaborative partners developed an adaptive management framework as an operating philosophy for this partnership and the Healthy Waterways Plan. The adaptive management framework is cyclical and iterative with five major elements (Abal et al. 2005): Policy Planning, Implementation, Monitoring, Evaluation, and Improved Understanding. Adaptive management is a cornerstone of this decade-long omplemented intitiative to improve the waterways and bays in the region around Brisbane. Details about the Healthy Waterways Initiative and its adaptive management elements can be found at www.healthywaterways.org.



Knowledge Base for Adaptive Management

The knowledge base is the foundational scientific understanding of a system, both environmental and social, that creates the context for planning stages of scientific adaptive management. A strong knowledge base informs policy makers and the public. It has wide benefit, as seen in the work of the Council's Delta Science Program (formerly the CALFED Science Program). The following elements of the knowledge

base also provide information necessary to effectively plan, implement, and decide within an adaptive management framework: 1) best available science, 2) scientific research to understand change, and 3) monitoring to detect change. These elements create the capacity for informed planning, meaningful implementation, and knowledgeable decision making.

Best Available Science

Best available science is specific to the decision be made and the time frame available for making that decision. There is no expectation of delaying decisions to wait improved scientific understanding. Action may be taken based on incomplete science if the information used is the best available at the time.

Best available science shall be developed and presented in a transparent manner including clear statements of assumptions, the use of conceptual models, description of methods used and presentation of summary conclusions. Sources of data used shall be cited and analytical tools used in analyses and syntheses identified. Best available science changes over time and decisions may need to be revisited as new scientific information becomes available. Targeted investment in science reduces scientific uncertainty and improves best available science.

Best available science must be consistent with the scientific process[1] which is described below and includes the steps for achieving best science, guidelines and criteria, effective communication and documentation, and a process for reviewing the scientific rationale upon which Delta Plan strategies and performance measures are built. Ultimately, best available science requires the best scientists using the best information and data to assist management and policy decisions. The processes and information used should be clearly documented and effectively communicated.

Steps for Achieving Best Science

Science consistent with the scientific process includes the following elements: well-stated objectives, a clear conceptual model, a good experimental design with standardized methods for data collection, statistical rigor and sound logic for analysis and interpretation, and clear documentation of methods, results, and conclusions. The best science is transparent; it clearly outlines assumptions and limitations. The best science is also reputable; it has undergone peer review conducted by active experts in the applicable field(s) of study. Scientific peer review addresses the validity of the methods used, the adequacy of the methods and study design in addressing study objectives, the adequacy of the interpretation of results, whether the conclusions are supported by the results, and whether the findings advance scientific knowledge.[2]

There are several sources of scientific information and trade-offs associated with each.[3] The primary sources of scientific information, in order of most to least scientific credibility for informing management decisions, include: independently peer-reviewed publications including journal publications and books (most desirable); general reports and publications; science expert opinion; and anecdotal evidence, as summarized in Table 2-1. Each of these sources of scientific information may be the best available at a given time, containing varying levels of understanding and uncertainty. These limitations shall be clearly documented when used to inform decisions.

[1] Sullivan, P. J., J. M. Acheson, P. L. Angermeier, T. Faast, J. Flemma, C. M. Jones, E. E. Knudsen, T. J. Minello, D. H. Secor, R. Wunderlich, and B. A. Zanetell. 2006. *Defining and implementing best available science for fisheries and environmental science, policy, and management*. American Fisheries Society, Bethesda, Maryland, and Estuarine Research Federation, Port Republic, Maryland. Available from http://www.fisheries.org/afs/docs/policy_science.pdf (accessed July 2010).

[2] Sullivan et al., 2006.

[3] Sullivan et al., 2006; Ryder, D.S., M. Tomlinson, B. Gawne, and G.E. Likens. 2010. *Defining and using 'best available science': a policy conundrum for the management of aquatic ecosystems.* Marine and Freshwater Research 61: 821-828.

Guidelines and Criteria

Several efforts have been conducted in order to develop criteria for defining and assessing "best available science." In 2004, the National Research Council Committee on Defining the Best Scientific Information Available for Fisheries Management prepared a report (NRC Report) that concluded that guidelines and criteria need to be defined in order to apply best available science in natural resource management.[4] Major findings and recommendations included establishing procedural guidelines and implementation guidelines to govern the production and use of scientific information. The guidelines were based on six broad criteria which are (1) relevance, (2) inclusiveness, (3) objectivity, (4) transparency and openness, (5) timeliness, and (6) peer review.

Table 2-1
Prioritized List of Sources of Science from Most to Least Scientific Credibility

Source	Content	Review Level	Timeliness	Availability
Peer-reviewed publications	New findings	Formal, independent external	Slow to medium	Broadly available
General scientific reports and publications	Standard reports and analyses	Informal, internal/external	Medium	Available from source
Science expert opinion	Opinion and broadly held understanding	Through reputation only	Fast	Available from individuals and groups
Anecdotal evidence	Personal observations and beliefs	Limited to none	Fast	Available from individuals and groups

Sources with more "scientific credibility" are at the top of the list.[5]

The Legislature of the State of Washington also developed criteria for assessing best available science which are used by counties and cities in developing policies and regulations pursuant to the Washington State Growth Management Act. The State of Washington criteria include six characteristics for a valid scientific process: (1) peer review, (2) methods, (3) logical conclusions and reasonable inferences, (4) quantitative analyses, (5) context, and (6) references.[6]

For the purpose of informing adaptive management of proposed covered actions, "best available science" for Delta-related activities should be consistent with the guidelines and criteria developed by the NRC and the State of Washington. Proposed plans, programs, and projects should document that the science used follows these criteria adapted from the NRC report as they apply to the Delta environment:

- **Relevance.** Scientific information used should be germane to the Delta ecosystem attribute and/or biologic organism (and/or process) affected by the proposed covered actions. Analogous information from a different region, but applicable to the Delta ecosystem and/or biota may be the most relevant when Delta-specific scientific information is non-existent or insufficient. The quality and relevance of the data and information used shall be clearly addressed.

[4] National Research Council, Committee on Defining the Best Scientific Information Available for Fisheries Management. 2004. *Improving the use of "Best Scientific Information Available" Standard in Fisheries Management.* National Academy Press, Washington D.C. Available from http://www.nap.edu/catalog.php?record_id=11045#toc (accessed July 2010).

[5] Adapted from Sullivan et al., 2006.

[6] Washington Administrative Code (WAC) 365-195-900. Available from http://apps.leg.wa.gov/wac/default.aspx?cite=365-195-900 (accessed July 2010); Washington Administrative Code (WAC) 365-195-905. Available from http://apps.leg.wa.gov/wac/default.aspx?cite=365-195-905 (accessed July 2010).

- **Inclusiveness.** Scientific information used shall incorporate a thorough review of all relevant information and analyses across all relevant disciplines. There are many analysis tools available to the scientific community.[7]

- **Objectivity.** Data collection and analyses considered shall meet the standards of the scientific method and be void of non-scientific influences and considerations.[8]

- **Transparency and Openness.** The sources and methods used for analyzing the science (including scientific and engineering models) used shall be clearly identified. The opportunity for public comment on the use of science in proposed covered actions is recommended. Limitations of research used shall be clearly identified and explained. If a range of certainty is associated with the data and information used, a mechanism for communicating uncertainty shall be employed.[9]

- **Timeliness.** There are two main elements of timeliness: (1) data collection shall occur in a manner sufficient for adequate analyses before a management decision is needed, and (2) scientific information used shall be applicable to current situations. Timeliness also means that results from scientific studies and monitoring may be brought forward before the study is complete to address management needs.[10] In these instances, it is necessary that the uncertainties, limitations, and risks associated with preliminary results are clearly documented.

- **Peer Review.** The quality of the science used will be measured by the extent and quality of the review process. Independent external scientific review of the science is most important because it ensures scientific objectivity and validity.[11] The following criteria represent a desirable peer review process:[12]

    - Independent External Reviewers. A qualified independent external reviewer embodies the following qualities: (1) has no conflict of interest with the outcome of the decision being made, (2) can perform the review free of persuasion by others, (3) has demonstrable competence in the subject as evidenced by formal training or experience, (4) is willing to utilize his or her scientific expertise to reach objective conclusions that may be incongruent with his or her personal biases, and (5) is willing to identify all costs and benefits of ecological and social alternative decisions.

    - When to Conduct Peer Review. Independent scientific peer review shall be applied informally or formally to proposed projects and initial draft plans, formally to written review once official draft plans or policies are released to the public, and formally to final released plans.

    - Coordination of Peer Review. Independent peer review shall be coordinated by entities and/or individuals that (1) are not a member of the independent scientific review team, (2) have a particular and special expertise in the subject under review, and (3) have had no direct involvement in the particular actions under review.

It is recognized that there are differences in the accepted standards of peer review for various fields of study and professional communities. When applying the above criteria for best available science, the

[7] McGarvey, DJ. 2007. "Merging Precaution with Sound Science under the Endangered Species Act." Bioscience 57: 65-70.

[8] NRC 2004; Sullivan et al., 2006.

[9] Lukey, J.R., S.S. Crawford, and D. Gillis. 2009. "Effect of Information Availability on Assessment and Designation of Species at Risk". *Conservation Biology.*

[10] NRC, 2004.

[11] Meffe, G.K., P.R. Boersma, D.D. Murphy, B.R. Noon, H.R. Pulliam, M.E. Soule, and D.M. Waller. 1998. "Independent Scientific Review in Natural Resource Management." *Conservation Biology*. 12: 268-270.

[12] Adapted from Meffe et al., 1998.

Council will recognize that the level of peer review for supporting materials and technical information (i.e. scientific studies, model results, and documents) included in the scientific justification for a proposed covered action is variable and relative to the scale, scope, and nature of the proposed covered action. The Council understands that varying levels of peer review may be commonly accepted in various fields of study and professional communities and will take this into consideration when reviewing the scientific justification for proposed covered actions.

Scientific Research to Understand Change

Scientific understanding about the Delta is not static and has changed considerably over time (Healey et al. 2008, Lund et al. 2010). For example, our understanding of key drivers in ecological and social components of the Delta has changed over time (See Box 2).

In order to build the knowledge base for informing adaptive management within the Delta over the next few decades, ongoing investment in research is essential for understanding how the system changes over time. Delta related research should 1) focus upon key uncertainties, 2) support the best and brightest through competitive grant programs, 3) invest in young scientists and researchers, 4) utilize peer review in the selection of research projects, 5) look to local and outside experts to focus and define research topics, and 6) welcome and support alternative ways of learning about the system (e.g. through involvement of local communities in scientific projects and discussions). The Delta Science Program will be the central entity in supporting this research to understand the Delta as a changing place and build upon the knowledge base used to support adaptive management.

Box 2 – Examples of Changes in the Knowledge Base for the Delta

- *The State of Bay-Delta Science, 2008* was published to summarize and synthesize the current scientific understanding of the Bay-Delta at that time. The Delta Science Program, along with the Department of Fish and Game's [Ecosystem] Restoration Program, fund research to improve scientific understanding of the Bay-Delta ecosystem on topics relevant to decision-makers' needs for making informed management and policy decisions. http://www.science.calwater.ca.gov/pdf/publications/sbds/sbds_final_update_122408.pdf
- *Interagency Ecological Program 2010 Pelagic Organism Decline Synthesis of Results Through August 2010:* The 2010 IEP POD Synthesis report explains the evolution of the IEP's understanding of the POD and the Delta ecosystem over time. The 2010 report highlights the evolution of the POD conceptual model from 2005 to the present. The evolution of the conceptual model highlights the change in thinking from a classical food web and fisheries ecology approach, to species-specific models, to an ecological regime shift model. This evolution in thinking has come from monitoring and analysis of the Delta ecosystem over time. http://www.water.ca.gov/iep/docs/FinalPOD2010Workplan12610.pdf

Monitoring to Detect Change

Monitoring to detect change in the Delta will require that objectives of the monitoring are clearly linked to actions emanating from well-stated goals and objectives. Monitoring activities in the Delta should build upon the strengths and long-term data sets of the Interagency Ecological Program and other regional monitoring programs. The Interagency Ecological Program (IEP) is a collaborative effort among nine state and federal agencies to monitor ecological changes in the Delta (www.water.ca.gov/iep). This cooperative program produces publicly accessible data sets that include fish and wildlife status and trends, water quality, estuarine hydrodynamics, and food web monitoring.

Effective Governance

To be effective, governance to support and implement adaptive management for a changing Delta must have the capacity to change policies and practices in response to what is learned over time. Governance for adaptive management should provide a decision-making structure that fosters communication between scientists and decision makers, and has clear lines of authority where timely decisions are made and implemented. Governance for implementing adaptive management must provide for the institutional capacity to interact, learn, and adapt. Governance, oversight and review for the use of the adaptive management framework and supporting knowledge base presented in this chapter are explained in further detail in Chapter 3.

References

Abal, E. G., S. E. Bunn, and W. C. Dennison, editors. 2005. Healthy Waterways Healthy Catchments: Making the Connection in South East Queensland, Australia. Moreton Bay Waterways and Catchments Partnership, Brisbane.

BDCP Independent Science Advisors on Adaptive Management. 2009. Bay Delta Conservation Plan Independent Science Advisor's Report on Adaptive Management. Page 14.

CALFED Bay-Delta Program. 2000. Ecosystem Restoration Program Plan: Strategic Plan for Ecosystem Restoration. CALFED Bay-Delta Program, Sacramento, California.

Christensen, N. L., A. M. Bartuska, J. H. Brown, S. Carpenter, C. D'Antonio, R. Francis, J. R. Franklin, J. A. MacMahon, R. R. Noss, D. J. Parsons, C. H. Peterson, M. G. Turner, and R. G. Woodmansee. 1996. The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management. Ecological Applications 6:665-691.

Habron, G. 2003. Role of adaptive management for watershed councils. Environmental Management 31:29-41.

Healey, M. 2008. Science in policy development for the Bay-Delta. Page 174 in M. C. Healey, M. D. Dettinger, and R. B. Norgaard, editors. The State of Bay-Delta Science, 2008. The CALFED Science Program, Sacramento.

Healey, M., M. Dettinger, and R. Norgaard, editors. 2008. The State of Bay-Delta Science, 2008. CALFED Science Program, Sacramento, CA.

Kaplan, R. S. and D. P. Norton. 2008. Mastering the Management System. Harvard Business Review:17.

Lund, J. R., E. Hanak, W. E. Fleenor, W. A. Bennett, R. E. Howitt, J. F. Mount, and P. B. Moyle. 2010. Comparing Futures for the Sacramento-San Joaquin Delta. University of Califronia Press.

Stanford, J. A. and G. C. Poole. 1996. A Protocol for Ecosystem Management. Ecological Applications 6:741-744.

Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. Adaptive Management: The U.S. Department of the Interior Technical Guide. Page 84 in A. M. W. Group, editor. U.S. Department of the Interior, Washington, D.C.

Chapter 3
Governance Plan to Support Coequal Goals

The Sacramento-San Joaquin Delta Reform Act established the Delta Stewardship Council to achieve more effective governance as reflected in these findings in Water Code section 85001:

> *(a) The Sacramento-San Joaquin Delta watershed and California's water infrastructure are in crisis and existing Delta policies are not sustainable. Resolving the crisis requires fundamental reorganization of the state's management of Delta watershed resources...*
>
> *(c) By enacting this division, it is the intent of the Legislature to provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem, to provide for a more reliable water supply for the state, to protect and enhance the quality of water supply from the Delta, and to establish a governance structure that will direct efforts across state agencies to develop a legally enforceable Delta Plan.*

A primary responsibility of the Council is developing and implementing a Delta Plan, defined as "... the comprehensive, long-term management plan for the Delta as adopted by the council in accordance with this division" (Water Code section 85059).

This chapter details how the Council will meet the governance responsibilities of the Act and is divided into six sections. The first two sections of the chapter address how the Council will make decisions in implementing the Act:

- General Policies for all Proposed Covered Actions, and
- Core Policies for Council Use in All Decisions.

As the Delta Plan is implemented, there are processes, and other actions that will increase the likelihood of success of the Delta Plan. These are described in the following three sections:

- Communication Plan to Implement the Delta Plan,
- Best Available Science, and
- Review and Revision of the Delta Plan.

Recommendations to further improve capacity of the State of California and local agencies to achieve the goals of the Act are included in the final section:

- Recommendations for Legislative Action to support achieving the purposes of the Sacramento-San Joaquin Delta Reform Act of 2009.

This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.

Implementing the Act

Delta Stewardship Council Governance Roles

The Council has six defined roles under SBX7 1 which together constitute how it will satisfy its governance responsibilities. In terms of Council work, the roles are in three groups, shown below. Each role has specific legal authority. (Illustrative legal authority is provided here; full legal authority is in several sections of SBX7 1 and the Constitution of the State of California.)

Finding of Consistency under the Covered Actions Review

1. Determinations of consistency of covered actions [e.g., "... The appeal shall be heard by the council within 60 days of the date of the filing of the appeal..." (e.g., Water Code section 85225.20)]

Information, Comment and Advice

2. Information [e.g., "...the mission of the Delta Science Program shall be to provide the best possible unbiased scientific information to inform water and environmental decision-making in the Delta." (Water Code section 85280(b)(4)]

3. Comments [e.g., "To comment on state agency environmental impact reports..." (Water Code section 85210(j)]

4. Advice regarding plan consistency [e.g., "The council shall review and provide timely advice to local and regional planning agencies regarding the consistency of local and regional planning documents..."(e.g., Water Code section 85212)]

Incorporation of another Plan into the Delta Plan

5. Incorporation of another plan into the Delta Plan [e.g., "The council may incorporate other completed plans... into the Delta Plan to the extent that the other plans promote the coequal goals" (Water Code section 85350)] Criteria for required incorporation of BDCP are specified in Water Code section 85320(a).

6. Revision of the Delta Plan [e.g., "The council shall review the Delta Plan at least once every five years and may revise it as the council deems appropriate." (Water Code section 85300(c))]

Decisions of the Council will be based upon their full authority, including the Act, any applicable provisions of the Constitution of the State of California, this Delta Plan, best available science, and the full record before them.

Submissions of Certification for Proposed Covered Actions

Covered actions carried out, approved, or funded by other state and local agencies are central to achieving the coequal goals. Specific requirements regarding implementation of a covered action, including adaptive management and warranties, establish and clarify continuing responsibility regarding covered actions. They provide flexibility for agencies to satisfy the Act and to effectively implement covered actions for which they are responsible, allowing them to determine how to meet these responsibilities within the parameters of other legal authorities.

GP P1. Any state or local agency proposing to carry out, approve, or fund a covered action shall include the following in their consistency finding:

a) Information required to determine legal authority, financing and operational features of the proposed covered action, including at a minimum a description of:

- legal authority as it relates to the proposed covered action;
- financing, including identified funding sources;
- allocation of costs and risks in relationship to benefits received;
- how the proposed covered action addresses each relevant policy or recommendation of this Delta Plan, including identification of possibly accomplishing multiple policies, working effectively with other covered actions, or jeopardizing or making more difficult achieving the Delta Plan's policies and targets;
- capacity of the plan, program, or project proponent to implement the proposed covered action; and,
- provision for addressing failure to achieve results consistent with the policy objectives of the Act.

Authority: Water Code sections 85020(a)(h), 85022(a), 85225

b) Adequate, enforceable provisions for implementation of the proposed covered action consistent with the Delta Plan, including the following warranties:

- The project currently complies with all governmental policies related to water diversion and use, water quality, ecosystem function, species protections and land use.
- All features of the proposed covered action will be fully implemented, including incorporation into relevant financing instruments, contracts, leases and other legal documents.
- Continuing responsibility for full implementation of the covered action shall be ensured, including provisions that guarantee continuing legal and financial responsibility or their equivalent if the proposed covered action is transferred to another party.
- To fully disclose any redirected impacts to third parties that could jeopardize achieving the objectives of the Act and to implement any required mitigations in ways that support achieving the objectives of the Act.

Authority: Water Code section 85225

c) It is the policy of the Delta Stewardship Council that Delta-related plans, programs and projects that meet the definition of "covered action" (Water Code section 85057.5) shall

clearly describe the use of adaptive management in planning, implementation and decision making, unless adaptive management concepts are inapplicable based on the nature of the covered action, including at a minimum these provisions:

- Document the proposed covered action's adaptive management approach and how it is consistent with the Delta Plan adaptive management framework.
- Document, including citations for best available science, how the proposed covered action will achieve its desired result and is consistent with the Delta Plan and meeting the Plan's targets. Authority: Water Code section 85225, 85308(a).
- Identify relevant Delta Plan performance measures and targets as well as covered action performance measures and targets, and specification of how this covered action will be assessed in regards to achieving those targets. Authority: Water Code sections 85211, 85308.
- Provide monitoring and analyses sufficient to determine that implementation of the covered action is consistent with achieving the relevant target and also to capture any effects that may help or hinder achieving the coequal goals as expressed in the Act or the Delta Plan. Monitoring and analyses should be coordinated with existing related efforts to maximize resource use efficiency and increase the potential for learning. Provide reports to the Council at least every 2 years. Authority: Water Code sections 85211, 85308(c).
- Provide for incorporating best available science in interpreting performance in achieving targets and as the agency makes any recommendations for changed implementation of the covered action. Authority: Water Code section 85308(a).
- Delineate authority by the agency responsible for the covered action to make decisions for any adaptive management modification of the project. Authority: Water Code section 85308(f).
- Guarantee of sufficient funds to support the full adaptive management process, including planning, implementation, monitoring, data management, analyses, obtaining the best available science, communicating results, supporting decision making, and full implementation of any changes in implementation of the covered action. Authority: Water Code section 85308(f).
- Guarantee and provide procedures ensuring public release of all information developed related to adaptive management, including, but not limited to, raw data, modeling, analyses, and syntheses of research findings. Authority: Water Code section 85308(f).
- Provide a legally enforceable mechanism to guarantee that the preceding adaptive management measures are carried out. Authority: Public Resources code section 29702, Water Code sections 85225.

d) Any covered action with a useful life of more than 10 years or a total capital and operating cost of more than $10 million dollars over a ten year period shall include both an economic analysis and a financing plan. The Council may adopt a standard format that will facilitate Council understanding of the action's impacts on the state's economic vitality. Authority: Water Code section 85302(d)(2)

Policies for Council Use in all Decisions

The Council uses these policies to ensure that it considers and satisfies requirements of the Act in support of the coequal goals:

GP P2. The Council is committed to making progress on the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem over roughly similar time frames, with roughly equivalent certainty regarding effectiveness. The Council is committed to achieving the coequal goals in a manner that protects and enhances the Delta as an evolving place. Authorities: Public Resources Code section 29702(a); Water Code section 85300(a)

GP P3. The Council will consider all eight policy objectives enumerated in Water Code section 85020 in its actions. Authority: Water Code section 85020

GP P4. Where the Council reviews, on appeal, whether a covered action is consistent with the Delta Plan, the Council shall confirm (a) legal authority, (b) adequate financing, including identified funding sources, (c) sufficient capacity to implement and (d) provision for addressing failure to achieve results consistent with the policy objectives of the Act. Authorities: Water Code sections 85020(a)(h), 85022(a)

GP P5. The Council will inform its decisions with the best available science, using the criteria regarding best available science, and valuing information in the priority order from peer reviewed as highest to anecdotal as lowest, shown in Table 3-1. Authority: Water Code section 85308(a)

GP P6. Where the Council reviews, on appeal, whether a covered action is consistent with the Delta Plan, the Council will consider only information that is available to the public. References to "black box" models, algorithms, maps, analyses, or results that cannot be checked or replicated by others may be considered in accordance with the hierarchy of best available science shown in Table 3-1. The information must be made available to the greatest extent possible. Authority: Water Code sections 85308(a)(f)

GP P7. As required by Water Code section 85211, the Delta Plan includes performance measures for those characteristics of a healthy Delta ecosystem enumerated in Section 85302(c), the measures to promote a more reliable water supply enumerated in Section 85302(d), and the subgoals and strategies for restoring a healthy ecosystem enumerated in Section 85302(e). For each of these, the Council establishes a measurable target to be achieved at specified times, as required by Section 85308(b). Those targets shall be a basis for action under the adaptive management required in Section 85308(f). Authorities: Water Code sections 85211, 85302(c), 85302(d), 85302(e), 85308(b), 85308(f)

GP P8. Where the Council reviews, on appeal, whether a covered action is consistent with the Delta Plan, the Council shall assess whether the covered action accomplishes multiple objectives, combines covered actions, and includes implementation measures which work together effectively.Authority: Water Code section 85020

GP P9. The allocation of costs and risks shall be identified for a covered action. Authority: Water Code section 85302(d)(2)

Communications Plan to Implement the Delta Plan

The Council is committed to transparency and effective participation in its processes. To that end, the Council requires full transparency in information provided to it and timely public posting of information relevant to its actions.

It also seeks strong working relationships with agencies and stakeholders. Important components of those effective working relationships are procedures that ensure transparency and robust procedures for early consultation that are used consistently.

Decisions of the Council will be posted on its website. A public list of policies and plans determined to be consistent and not consistent with the Act shall be maintained on the Council website and included in reports of the Council on its effectiveness in implementing the Act.

Where required by law or as it deems feasible and appropriate, the Council will provide findings for its actions, which shall be posted publicly.

Information developed by the Council or provided to the Council shall be publicly accessible on the Council's website.

Best Available Science

Best available science is a process that meets the criteria of (1) relevance, (2) inclusiveness, (3) objectivity, (4) transparency and openness, (5) timeliness, and (6) peer review.[13] Best available science is consistent with the scientific process.[14] Best available science is specific to a decision context and would necessarily be related to the specific decision to be made and the time frame available for that decision. For science to be considered "best available" to support a decision, reasonable care must be taken to identify all available and relevant scientific information. Sources for best available science may include peer reviewed publications, general scientific reports and publications, scientific expert opinion, or even anecdotal evidence. See Chapter 2 for a more detailed discussion of best available science. Table 3-1 (identical to Table 2-1) establishes the priority for value to be given among the sources of information. Authority: Water Code sections 85302(g) and 85308(a).

[13] National Research Council, Committee on Defining the Best Scientific Information Available for Fisheries Management. 2004. *Improving the use of "Best Scientific Information Available" Standard in Fisheries Management.* National Academy Press, Washington D.C. Available from http://www.nap.edu/catalog.php?record_id=11045#toc (accessed July 2010).

[14] Sullivan, P. J., J. M. Acheson, P. L. Angermeier, T. Faast, J. Flemma, C. M. Jones, E. E. Knudsen, T. J. Minello, D. H. Secor, R. Wunderlich, and B. A. Zanetell. 2006. *Defining and implementing best available science for fisheries and environmental science, policy, and management*. American Fisheries Society, Bethesda, Maryland, and Estuarine Research Federation, Port Republic, Maryland. Available from http://www.fisheries.org/afs/docs/policy_science.pdf (accessed July 2010).

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Source	Content	Review Level	Timeliness	Availability
Peer-reviewed publications	New findings	Formal, independent external	Slow to medium	Broadly available
General scientific reports and publications	Standard reports and analyses	Informal, internal/external	Medium	Available from source
Science expert opinion	Opinion and broadly held understanding	Through reputation only	Fast	Available from individuals and groups
Anecdotal evidence	Personal observations and beliefs	Limited to none	Fast	Available from individuals and groups

Sources with more "scientific credibility" are at the top of the list.[15]

Review and Revision of the Delta Plan

GP P10. The Council shall conduct adaptive management reviews of the Delta Plan at least once every five years or as it deems desirable, including these four phases:

1. Assessment of progress in meeting the objectives of the Act and Delta Plan, including these elements:
   - assembling and assessing quantitative and other otherwise measurable indicators of progress in achieving performance measures and targets,
   - assessments provided by the Delta Independent Science Board and the Delta Science Program,
   - assessments provided by responsible and relevant agencies, and
   - opportunities for public input regarding progress in meeting the objectives of the Act and Delta Plan.
2. Identification of possible adaptive management actions, including these elements:
   - advice and recommendations provided by responsible and relevant agencies, and
   - opportunities for advice and recommendations from Delta Stewardship Council staff and the public.
3. Assessment of possible adaptive management actions, including these elements:
   - assessment by Delta Stewardship Council staff of the legal, administrative, and financial feasibility of possible adaptive management actions;
   - assessment by Delta Stewardship Council staff of interactions of the possible adaptive management actions with all objectives of the Delta Plan consistent with the provisions of this chapter for review of any covered action; and,
   - assessments from the Delta Independent Science Board and the Delta Science Program.

[15] Adapted from Sullivan et al., 2006.

4. Decision by the Council. Authorities: Water Code sections 85300(c), 85308(f), 85052, 85280(b)(4), 85211

Improving the Capacity of the State and Local Agencies

Recommendations for Legislative Action

GP R1. The Council supports creation of a benefit assessment flood management agency for the Delta and urges consideration of various forms of such districts, including possible organization as a Geologic Hazard Abatement District.

GP R2. The Council supports extension of the geographical responsibilities of the Delta Protection Commission and the Delta Conservancy to match those defined as the Delta in Water Code section 85058. This extends the geographic scope of the Delta Protection Commission and Delta Conservancy to the legal Delta and Suisun Marsh.

Chapter 4
Manage Water Resources

[Ed. Note: Preliminary version of this chapter is included in this draft for review. It is anticipated that this chapter could undergo revision in subsequent versions of the Staff Draft Delta Plan.]

Introduction is under development.

This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.

Findings

This section is under development.

Water Resources Policies

It shall be the policy of the State of California that:

WR P1. **Water Flow Standards.** The State Water Resources Control Board should review and adopt new regulatory water flow standards as follows:

a) By January 2, 2014, adopt public trust flow standards for the Delta that are necessary to achieve the Coequal Goals.

b) By January 2, 2018, adopt public trust flow standards for the Delta watershed that are necessary to achieve the Coequal Goals.

c) Prior to the date indicated in (a), the Council will utilize existing Delta flow standards. If the State Water Resources Control Board fails to act by that date, the Council will consider new projects or covered actions to be inconsistent with the Delta Plan.

d) Prior to the date indicated in (b), the Council will utilize existing Delta watershed flow standards. If the State Water Resources Control Board fails to act by that date, the Council will consider new projects or covered actions to be inconsistent with the Delta Plan.

WR P2. **Regional Water Self-Sufficiency.** All water agencies within the study area of the Delta Plan shall develop and implement a plan similar to an Integrated Regional Water Management Plan, no later than January 1, 2015 and shall update that plan at least every five years. Water resource planning covered actions are inconsistent with the Delta Plan should these regional plans not be developed and implemented. Key elements of the regional plans shall include:

- **Planning for possible interruption of Delta Water Supply:** Each region (or agency, as appropriate) shall adopt plans which allow continuation of water service to their customers, in a circumstance that may see interruption of water supplies from the Delta for up to six months to their customers, using only the water supplies otherwise available to the agency, in the event the Delta's export operations are interrupted during an average water year, dry water year, and following three dry water years.

- **Water Use Efficiency:** Each region (or agency, as appropriate) shall, at a minimum, meet the standards established in SBX7 7 for water use efficiency (including urban and agricultural standards) in 2015 and 2020. While the legislation requires a report and recommendations by the Department of Water Resources to the Legislature, should no action revising the standards be taken, revised standards for water use efficiency in 2025, 2030, and beyond, will be developed by the Council in conjunction with the State Water Resources Control Board and the Department of Water Resources after consultation with key stakeholders for use in consistency determinations.

- **Water Recycling:** Each region (or agency, as appropriate) shall optimize the use of recycled water. The plans must identify additional recycling that could be implemented in a way that increases the local supply and potentially reduces reliance on water from the Delta Watershed based upon the State Water Resources Control Board Recycled Water Policy goals (as defined in Table 1, pages 13-14 of the Department of Water Resources 2010 Integrated Regional Water Management Guidelines).

- **A Sustainable Water Supply:** Each region (or agency, as appropriate) shall clearly identify its sources of water use, and the relative likelihood of the amount indicated being received, over a 20-year period. If it appears that the region lacks balance—that the demand for water may exceed the reasonable level of assumed supply—their plan shall clearly indicate the steps that will be taken to bring each region into balance, including current sources, options to reduce demand, find new water sources, provide additional treatment and reuse of existing non-potable supplies, develop regionally-appropriate surface water and groundwater storage, and integrated surface water and groundwater operations. This shall be a comprehensive analysis including groundwater.

- **Use of Currently Non-Potable Groundwater:** Each region (or agency, as appropriate) that relies on groundwater basins experiencing a decline in groundwater elevations shall develop non-potable groundwater to offset the decline, if feasible.

- **Storm Water Capture and Recharge:** Each region (or agency, as appropriate) shall optimize the use of programs and projects that capture storm water, where feasible.

- **Seawater Desalination:** Each region (or agency, as appropriate) shall consider seawater desalination for implementation, in particular when its impacts are less environmentally damaging than withdrawing and transporting water from the Delta watershed.

WR P3. Water users who impact the Delta will report on water use. Specifically, agencies currently receiving water diverted or exported from the Delta or Delta Watershed, and those anticipating receiving water diverted or exported, shall report the amount of water diverted and the amount of water used, through the State Water Resources Control Board's Electronic Water Rights Information Management System (eWRIMS) annually. Agencies shall be a participant on an ongoing basis, with the Department of Water Resources Water Planning Information Exchange (Water PIE) as it becomes available. Reporting shall include a full water balance, including production from all sources, system losses, changes in storage and water use.

WR P4. All future State Water Project water supply contracts shall be developed in a transparent manner (as an example, the public process that Bureau of Reclamation uses for Central Valley Project water supply contract renewals). A summary shall be prepared and published 14 days prior to implementation of the contracts. The summary shall describe major contract terms for each contractor including:

- A table with specific amounts of water expected to be exported in different water supply-type years;
- Expected capital cost debt service; and
- Expected range of annual operations and maintenance costs.

NOTE: Additional or revised data may be added in subsequent versions of the Staff Draft Delta Plan.

WR P5. Future transfer agreements that depend upon conveyance through the Delta shall prepare a summary for publication 14 days prior to implementation of the transfer, including:

- A table with specific amounts of water expected to be transferred and conveyed through the Delta in different water supply-type years;
- Expected capital cost debt service; and
- Expected range of annual operations and maintenance costs.

NOTE: Additional or revised data may be added in subsequent versions of the Staff Draft Delta Plan.

WR P6. No project shall be constructed within the alignment of a conveyance facility or Ecosystem Restoration Opportunity Area, as described in Water Code section 85057.5(c), unless the project is consistent with the intent of the plan or the construction is required to avoid a regulatory taking.

WR P7. The Department of Water Resources shall complete the Integrated Storage Investigations and make recommendations by XXX to integrate each storage project into a proposed conveyance program and to support achievement of the coequal goals.

WR P8. Agencies currently receiving water diverted or exported from the Delta or Delta Watershed, and those anticipating receiving water diverted or exported, shall within the next 10 years develop and implement a sustainable rate structure that encourages and supports water use efficiency that includes, but is not limited to, a tiered rate structure.

Performance Measures and Targets

This section is under development.

Water Resources Recommendations

The Delta Plan recommends that:

WR R1. The involved federal, State, and local agencies complete the Bay Delta Conservation Plan (BDCP) process no later than December 31, 2014. Long additional delays in adoption of BDCP make it difficult, if not impossible, to proceed with action to achieve the coequal goals. In the event that the BDCP process is not complete by this date, the Council will proceed with ecosystem and conveyance planning recommendations needed to achieve the coequal goals, for inclusion in the first five-year update of the Delta Plan.

WR R2. Should local agencies fail to sustainably manage their groundwater basins, the State Water Resources Control Board should begin to regulate surface water and groundwater together as components of the same system on a balanced regional basis that prevents groundwater overdraft. Groundwater and surface water are part of the same system and failure to integrate management of groundwater and surface water makes it difficult, if not impossible, to achieve the coequal goals.

WR R3. In order to reduce reliance on the Delta, neither the State of California or any of its agencies or departments should authorize or approve any new points of delivery of State Water Project water, if the proposed point of delivery could increase the demand on the Delta, unless the proposed project has evaluated and implemented all other practicable water supply alternatives. Prior to any authorization or approval, a project applicant should demonstrate that the project is consistent with the coequal goals.

Chapter 5
Ecosystem Restoration

Introduction is under development.

This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.

Findings

This section is under development.

Ecosystem Restoration Policies

It shall be the policy of the State of California that:

ER P1. In order to immediately protect the Delta and Suisun Marsh, pending development and adoption of a more detailed ecosystem restoration plan, the Delta Plan adopts by reference the map and legend of Figure 4, "Land Elevations in the Delta EMZ will largely determine what habitat types can be accommodated," and Figure 5, "Map of EMUs within the Delta EMZ," on pages 35 and 47 of the Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone (Draft ERPCS), respectively.[16] These maps will be used for making initial determinations of consistency.

Covered actions that have ecosystem implications shall demonstrate that impacts on the potential for ecosystem restoration at the elevations shown in Figure 4 and in the EMUs shown in Figure 5 (and as explained in the text) have been fully considered and avoided or minimized in a way that appropriately protects the ecosystem. CEQA documentation associated with these actions shall consider the habitat values described generally in Section 2 of the Draft ERPCS

[16] The July 21, 2010 Draft ERPCS and its vision and proposed actions for restoring the Delta ecosystem is a source of guidance for the Delta Stewardship Council.

and subsequent revisions of this document. Authorities: Water Code sections 85020(c), 85302(c), and 85302(e)(1), (2), and (6).

ER P2. In order to commence protection of key species and habitats as identified in the Delta Plan, State and local agencies conducting covered actions subject to the Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (NMFS 2009)[17] (specifically the actions contained in *Action Suite I.6: Sacramento River Basin Salmonid Rearing Habitat Improvements*) and the Biological Opinion on the Proposed Coordinated Operations of the Central Valley Project and State Water Project (USFWS 2008)[18] (specifically the actions contained in *Component 4: Habitat Restoration*)shall implement the Reasonable and Prudent Alternative actions (RPAs) contained in those biological opinions unless:

- U.S. Fish and Wildlife Service and National Marine Fisheries Service agree to alternative measures that provide equal or improved conservation benefits;
- the RPAs or specific measures are invalidated in a court of law, in which case only those measures that remain in effect would be required; and/or,
- new biological opinions supersede and replace these opinions, in which case those opinions will replace those named above.

ER P3. Floodplains that are critical to support the sustainability of fish species that use the Delta shall be protected and conversion of active or currently disconnected floodplains (not including current urban areas) to uses that preclude ecosystem restoration shall be prevented. This policy is not intended, and shall not be construed as authorizing the Council or any entity acting pursuant to this section, to exercise their power in a manner that will take or damage private property for public use, without the payment of just compensation. This policy is not intended to affect the rights of any owner of property under the Constitution of the State of California or the United States.

ER P4. State and local agencies constructing new levees, substantially rehabilitating or reconstructing existing levees shall evaluate and incorporate, where feasible, alternatives (including use of setback levees) that would increase the extent of active floodplain and riparian habitats.

ER P5. The State Water Resources Control Board should review and adopt public trust flow standards for the Delta watershed by January 1, 2018 that are protective of beneficial uses and contribute to achievement of the ecosystem restoration objectives of the coequal goals. Pending adoption of these flow standards, any proposed projects that develop new or changed diversion patterns, or water volume, or places of use will be evaluated for consistency based on current standards. Should the standards be adopted, projects and programs will be judged for consistency using the new regulatory standards. Should no new regulatory standards be adopted, projects will be deemed inconsistent with the Delta Plan.

[17] The National Marine Fisheries Service's Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project addresses the effects of long-term operations on endangered Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), threatened Central Valley spring-run Chinook salmon (*0. tshawytscha*), threatened Central Valley steelhead (*0. mykiss*), threatened Southern Distinct Population Segment of North American green sturgeon (*Acipenser medirostris*), and the Southern Resident killer whale (*Orcinus orca*). This document can be found at http://www.swr.noaa.gov/ocap.htm.

[18] The U.S. Fish and Wildlife Service's biological opinion on the Proposed Coordinated Operations of the Central Valley Project and State Water Project addresses the effects of coordinated operations on the threatened delta smelt (*Hypomesus transpacificus)* and several other species. This document can be found at http://www.fws.gov/sacramento/es/delta_smelt.htm

ER P6. Local or regional land use plans shall not preclude opportunities for ecosystem restoration, habitat creation, channel modification for ecosystem benefit, or increased connectivity between water and land; or direct such uses away from their most effective locations.

Performance Measures and Targets

This section is under development.

Ecosystem Restoration Recommendations

The Delta Plan recommends that:

ER R1. The involved federal, State, and local agencies complete the Bay Delta Conservation Plan (BDCP) process (i.e. receive required incidental take permits) no later than December 31, 2014. If the BDCP process is not completed by this date, the Council will proceed with ecosystem and conveyance planning recommendations independent of the Bay Delta Conservation Plan process for inclusion in the first five-year update of the Delta Plan.

ER R2. The BDCP process should incorporate a robust and efficient adaptive management strategy (see Chapter 2) that enables decisions to be made quickly. Scientists should have a clear voice and be fully incorporated in making decisions that truly embody the concepts of adaptive management.

ER R3. Key decisions should be based on principles of resilience in the face of a changing Delta. The water supply and ecosystem should be resilient to sea level rise, increasing regulations, earthquake risks, invasive species and other stressors as time goes by. While the Bay Delta Conservation Plan is designed to receive a 50-year permit, that 50-year cycle should not be limiting. It would be contrary to the Delta Plan's basic mission if development occurs that is not capable of meeting the needs of the State into the next century.

ER R4. The Wildlife Conservation Board and Delta Conservancy as co lead agencies, in coordination with the Department of Water Resources, Department of Fish and Game, and other State and local agencies, should develop by XXX a plan and protocol for acquiring the land necessary to achieve ecosystem restoration consistent with the coequal goals and the Draft ERPCS.

ER R5. The Delta Conservancy Strategic Plan should:

- Develop and adopt criteria for prioritization and integration of large-scale ecosystem restoration in the Delta, with economic sustainability and use of best available science as foundational principles.
- Develop and adopt methods and processes for ownership and long-term operations and management of restored and/or conserved land in the Delta and Suisun Marsh.
- Recommend sources for long-term financing for programs and projects that include covering costs of long term operations and management and "Payment in Lieu of Taxes."
- Develop and adopt a formal mutual agreement with the Department of Water Resources, Department of Fish and Game, federal interests, and other State and local agencies on implementation of ecosystem restoration.

Chapter 6
Improve Water Quality

[Ed. Note: Preliminary version of this chapter is included in this draft for review. It is anticipated that this chapter could undergo revision in subsequent versions of the Staff Draft Delta Plan.]

Introduction is under development.

> *This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.*

Findings

This section is under development.

Water Quality Policies

It shall be the policy of the State of California that:

WQ P1. When determining the consistency of covered actions coming before the Council, or other matters within the jurisdiction of the Council, the proponents of covered actions who are also defined by the State Water Resources Control Board and/or Regional Water Quality Control Boards as responsible parties for implementing specific Total Maximum Daily Load programs shall demonstrate full compliance with their Total Maximum Daily Load obligations.

Performance Measures and Targets

This section is under development.

Water Quality Recommendations

The Delta Plan recommends that:

WQ R1. The State Water Resources Control Board and Regional Water Quality Control Boards should develop and adopt nutrient criteria for the Delta and Delta watershed by January 1, 2014.

WQ R2. The State Water Resources Control Board, Regional Water Quality Control Boards, and the Department of Pesticide Regulation should complete the Central Valley Pesticide Total Maximum Daily Load for diazonon and chlorpyrifos by January 1, 2013.

WQ R3. The State Water Resources Control Board, Regional Water Quality Control Boards, and the Department of Pesticide Regulation should complete the Central Valley Pesticide Total Maximum Daily Load for pyrethroids by January 1, 2021.

WQ R4. All water users that directly and indirectly discharge flows to the Delta should participate in the Central Valley Salinity Alternatives for Long-Term Sustainability Program (CV-SALTS).

WQ R5. The State Water Resources Control Board should complete and implement the Central Valley Drinking Water Policy by January 1, 2013.

WQ R6. The State Water Resources Control Board and/or Central Valley Regional Water Quality Control Board should develop regulations to protect the quality of groundwater used for drinking water.

WQ R7. The California Department of Public Health should develop regulations protect the quality of groundwater used for drinking water.

WQ R8. The California Department of Public Health should prioritize funding to develop sustainable water supplies based community needs for appropriate drinking water quality.

Chapter 7
Reduce Delta Flood Risk to People, Property, and State Interests

[Ed. Note: Preliminary version of this chapter is included in this draft for review. It is anticipated that this chapter could undergo revision in subsequent versions of the Staff Draft Delta Plan.]

Introduction is under development.

The Delta Reform Act requires that the Delta Plan attempt to reduce risks to people, property, and State interests in the Delta by, among other things, recommending priorities for State investments in levee operation, maintenance, and improvements in the Delta, including both project and nonproject levees (see Water Code section 85306; see also Water Code sections 85305 and 85307).

The Delta Reform Act expressly states that the provisions of the Act do not affect the liability of the State for flood protection in the Delta or its watershed (Water Code section 85032(j)). Consequently, no action taken by a State agency as required or recommended by, or otherwise in furtherance of, this Delta Plan shall affect the State's flood protection liability in the Delta or its watershed.

This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.

Findings

This section is under development.

Reduce Delta Flood Risk to People, Property, and State Interests Policies

It shall be the policy of the State of California that:

RR P1. No covered action may reduce the level of flood flow capacity through and/or around the Delta. Authorities: Public Resources Code section 29702; Water Code sections 85020(g), 85057.5(a)(4), 85306.

RR P2. The Delta Plan shall recognize that the statutory Delta "… is inherently a floodprone area wherein the most appropriate land uses are agriculture, wildlife habitat, and, where specifically provided, recreational activities …" (Delta Protection Act of 1992 (Public Resources Code section 29704)). Covered actions coming before the Council and other matters within the Council's jurisdiction shall apply this finding.

In determining consistency of land and resource uses proposed for floodprone areas, the Council shall apply the following policies:

- The proposal shall minimize human exposure to risks that could result in loss of life.
- The proposal shall be consistent with "Levee Classifications based on Land Uses" presented in Table 7-1.
- Flood-proofing[19] may be used as a strategy of risk reduction, but it shall be regarded as not fully addressing risks to life, or access for emergency response, evacuation, and maintenance.
- Covered actions shall include documentation of an adequate level of flood insurance for individuals, businesses, and industries in floodprone areas. Flood insurance is essential to reduce the financial losses of those who are flooded. Flood insurance may help to minimize taxpayer funded recovery efforts. However, flood insurance does not reduce risks to loss of life or to disruption of public services or natural resource values of interest to the State. Reliance on flood insurance may encourage and increase exposure to risk.
- The proposal shall not increase risk to public services maintained by the federal, State, or local governments.
- The proposal shall include legally-enforceable "hold harmless" provisions for the benefit of the State, if applicable.

RR P3. No covered action shall be considered consistent with the Delta Plan after January 1, 2015 unless the agency has brought its policies and plans into conformity with "Levee Classifications based on Land Uses," as shown in Table 7-1. Authorities: Water Code sections 85021, 85302, 85305, 85306.

RR P4. No covered action utilizing State investments for levee operations, maintenance, and improvements in the Delta shall be consistent with the Delta Plan unless it comports with the following investment strategies. Authorities: Water Code sections 85021, 85302, 85305, 85306.

[19] "Flood-proofing" means " the modification of individual structures and facilities, their sites, and their contents to protect against structural failure, to keep water out, or to reduce effects of water entry," according to 44 Code of Federal Register 9.4 [Title 44 -- Emergency Management and Assistance; Chapter I -- Federal Emergency Management Agency, Department of Homeland Security; Subchapter A -- General; Part 9 -- Floodplain Management and Protection Of Wetlands.]

- Investment priorities shall recognize measures to reduce risk of loss of life and protect the value of island uses and assets, cross-delta infrastructure, long-term sustainability of the island's current land uses, importance to State and regional interests, Delta hydrodynamics, effects on salinity intrusion and water quality, the ecosystem, and through-Delta water conveyance.
- Investment priorities shall recognize the wide variability of conditions across the Delta, including: depth of inundation upon failure, current height and condition of existing levees, and the degree of exposure to seismic shock, sea-level rise, climate change and river flood levels.
- Investment priorities shall recognize the wide differences in the resilience of land uses to short or long-term inundation.
- Investment priorities shall recognize that differing land and resource uses require different levels of protection and types of levees to provide the appropriate level of protection.
- Investment priorities shall be in compliance with the "Levee Classifications based on Land Uses," as shown in Table 7-1.
- Investment priorities shall compare investment in levees to other perhaps more cost-effective strategies including: flood-proofing, relocation of infrastructure, flood insurance, or changes in land use.
- Investment priorities shall be based upon a Delta-wide comparative benefit/cost analysis.

RR P5. The Council will consult with the Department of Water Resources and the Central Valley Flood Protection Board and determine if further revision of the Delta Plan for risk reduction purposes is required prior to the first five-year review.

RR P6. No covered action in the following geographical areas shall diminish existing or potential value as flood plains except as provided in this Delta Plan:

- Areas located in Yolo Bypass (Fremont Weir to Cache Slough, including the confluence of Putah Creek into the bypass) and through the Cache Slough area to the Sacramento River;
- The Cosumnes River/Mokelumne River confluence generally defined as the region from the southern border of New Hope Tract through Glanville Tract and from the Sacramento River to the eastern boundary of the legal Delta.
- The San Joaquin River/South Delta Floodplain, including all of Pescadero Tract, Paradise Cut, and Stewart Tract and Reclamation Districts R-2075, R-2064, R-2085, R-2094, R-2095, the portion of R-1007 generally north of Bethany Road, and the portion of R-2058 north of Interstate 205.

This policy is not intended, and shall not be construed as authorizing the Council or any entity acting pursuant to this section, to exercise their power in a manner which will take or damage private property for public use, without the payment of just compensation. This policy is not intended to affect the rights of any owner of property under the Constitution of the State of California or the United States.

Performance Measures and Targets

This section is under development.

Table 7-1
Levee Classifications based on Land Uses

Levee Goals						Levee Characteristics
		Land Use				
Levee Classification	Description	Wetlands/ Habitat	Agricultural	Residential, Commercial , and Industrial Land Uses[d]	Infrastructure	
Class 1	No specific goal[a]	✓	N/A	N/A	N/A	Typical height is less than 8 feet. Crest width is 12 feet or less. Exterior and interior slopes, assume 2H:1V. No seismic capability. Freeboard varies but levee is usually overtopped for water level with 1% annual frequency (i.e., 100-year return period or 100-year flood). Expect frequent failure.
Class 2[b]	HMP	✓	✓	N/A	✓	16 foot crest width. All-weather patrol road. Steep exterior slope (1.5H:1V). Steep interior slope (2H:1V). Marginal static stability (FS = 1.1+/-). No seismic capability. Freeboard = 1.0 foot (for water level with 1% annual frequency or 100-year flood). Could be modified by criteria being considered by Central Valley Flood Management Protection Plan for non-urban land uses and Federal Emergency Management Agency (FEMA).
Class 3	PL84-99	N/A	✓	N/A	✓	16 foot crest width. All-weather patrol road. Exterior slope (2H:1V). Interior slope (2H:1V to 5H:1V), based on levee height and depth of peat. Static stability (FS = 1.25). Levee toe drain 30 feet landward. Essentially no seismic capability. Freeboard = 1.5 feet (for 1% annual frequency or 100-year flood). Note: It may be appropriate for some habitat islands to have a levee system at the Pl 84-99 standard.
Class 4	FEMA – 100-year	N/A	N/A	N/A[h]	✓	16 foot crest width. All-weather patrol road. Toe drain. Exterior Slope (2H:1V). Interior Slope (varies, stability/seepage, 3H:1V to 5H:1V). Static stability (FS = 1.4 to 1.9). Seepage exit gradient ≤0.5. (FS and Seepage per Corps documents). Very little seismic capability. Freeboard = 3.0+ feet (for 1% annual frequency or 100-year flood). Note: It may be appropriate for some habitat or agricultural islands to have a levee system at the FEMA 100-year standard where it is demonstrated there are sufficient statewide or national benefits.
Class 5	FEMA – 200-year	N/A	N/A	✓[h]	✓	Like Class 4 but improved design and higher level of protection. Freeboard = 3.0+ feet (for 0.5% annual frequency or 200-year flood). Note: It may be appropriate for some habitat or agricultural islands to have a levee system at the FEMA 100-year standard where it is demonstrated there are sufficient statewide or national benefits.
Class 6	Seismic – fail/repair	N/A	N/A	N/A	✓	16 foot crest width. All-weather patrol road; toe drain. Exterior Slope (3H:1V to 5H:1V) Interior Slope (3H:1V to 10H:1V). Static stability (FS = 1.8 to 2.1). May slump up to 5 feet in design earthquake (200-year earthquake). Some breaches expected. Freeboard = 3.0+ feet (for 1% annual frequency or 100-year flood). Could be modified by criteria from Central Valley Flood Management Protection Plan for urban land uses.
Class 7[c]	Seismic – no fail	N/A	N/A	✓	✓	16 foot crest width. All-weather patrol road; toe drain. Exterior Slope (3H:1V and 5H:1V) Interior Slope (3H:1V and 10H:1V). Static stability (FS = 1.8 to 2.1). Dynamic stability (Ky = 0.15 to 0.27). Foundation and levee prepared, treated or compacted to resist liquefaction. May slump up to 1 foot in design earthquake (200-year earthquake). Freeboard = 3.0+ feet (for 1% annual frequency or 100-year flood). Could be modified by criteria from Central Valley Flood Management Protection Plan for urban land uses.
Class 8	Seismic super levee	N/A	N/A	✓	✓	Wide crest (as much as 200 feet). All-weather road(s) on crest. Other design factors similar to seismically resistant above. Could be modified by criteria from Central Valley Flood Management Protection Plan for urban land uses.

Table 7-1
Levee Classifications based on Land Uses

Levee Goals						Levee Characteristics
		Land Use				
Levee Classification	Description	Wetlands/ Habitat	Agricultural	Residential, Commercial , and Industrial Land Uses[d]	Infrastructure	

Notes:
[a] Class 1 levees are designed to serve the need of the habitat, and may be allowed to periodically fail.
[b] Islands where Class 2 levees are appropriate include those, after adequate consideration, that are judged to have no specific Statewide interest and may not be reclaimed after a levee failure.
[c] For populated areas subject to flooding that potentially could result in risk to human health and safety, only Class 7 or 8 levees provide adequate protection of life and safety.
[d] Levee protection for legacy towns should be determined based on site specific needs (e.g., floodwalls) and financing available.
[e] Estimated cost depends on foundation material and other site construction factors.
[f] Based on DRMS estimated costs.
[g] Based on actual levees constructed.
[h] Levees for areas with residential, commercial, and industrial businesses should comply with requirements contained in the Natural Resources Agency "Interim Levee Design Criteria for Urban and Urbanizing Areas in the Sacramento-San Joaquin Valley," and ultimately upgrade to at least Class 5 (FEMA 200-year).

Reduce Delta Flood Risk to People, Property, and State Interests Recommendations

The Delta Plan recommends that:

RR R1. The State Legislature should require that mandatory flood insurance be maintained for all human development and infrastructure activities (not including ecosystem restoration) within the statutory Delta, consistent with the Delta Plan.

RR R2. The Legislature should revise the State's Tort Claims Act (Government Code section 810 et seq.) to preclude recovery of damages from the State due to flooding, based on any tort theory or cause of action. The Legislature should add a specific immunity for flood protection activities, similar to those provided for police and correctional activities, Government Code section 844, and fire protection activities, Government Code section 850.

RR R3. The State Constitution should be amended to exempt flood control projects from inverse condemnation liability. Inverse condemnation was the basis for the Paterno decision.

RR R3. The State Constitution should be amended to exempt local flood control agencies from the two-thirds voting requirements of Propositions 218 and 26.

RR R4. State and local flood control agencies, and all new general plan and subdivision plans should identify areas that may be used for setback levees and protect those areas from future development until studies have been completed to determine the feasibility and appropriate design for levee repairs and rehabilitation. The plans also should identify a 100 foot minimum landside buffer zone from all existing levees for all future development plans. This buffer zone shall be reserved to facilitate the construction of levee rehabilitation and improvement projects.

RR R5. Because there is no Delta-wide plan developed by a State agency at this time that specifically identifies actions that will be taken in the event of a catastrophic failure of the existing Delta water conveyance system, the Department of Water Resources should develop and adopt no later than December 31, 2012, an emergency plan to protect the State Water Project from the consequences of a long term outage resulting from failures of Delta levees, resulting from catastrophic events. Such a plan should include, but not be limited to:

- A detailed listing of State water system operational rules and practices that will be modified to respond to such an emergency, and to the extent possible, provide similar information for federal water system operational rules and practices;
- Options to protect both the State Water Project reliability, and the Delta ecosystem that might be taken in response to such an emergency; and
- Drafts of potential Executive Orders requiring emergency water conservation measures by all affected water users to assist in addressing the potential problem.

RR R6. A Delta Flood Control Assessment District should be created with fee assessment authority to provide adequate flood control protection for the regional benefit of participants within the Delta. (Further details for this recommendation are being developed for subsequent versions of the Staff Draft Delta Plan.)

RR R7. State agencies should not renew or enter into leases on State-owned land that permit municipal, industrial, or agricultural land uses that promote or contribute to subsidence on the leased land.

Chapter 8
Protect and Enhance the Unique Cultural, Recreational, Natural Resources, and Agricultural Values of the California Delta as an Evolving Place

[Ed. Note: Preliminary version of this chapter is included in this draft for review. It is anticipated that this chapter could undergo revision in subsequent versions of the Staff Draft Delta Plan.]

Introduction is under development.

This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.

Findings

This section is under development.

Delta as an Evolving Place Policies

DP P1. No covered action involving any municipal, industrial, and/or agricultural development activities will be consistent with the Delta Plan until such time as the Economic Sustainability Plan prepared by the Delta Protection Commission is completed and determined by the Council to be consistent with the coequal goals. The Economic Sustainability Plan shall include, but not be limited to, the following items that address planning for:

- public safety, including flood protection;
- continued economic sustainability of Delta agriculture;

- legacy communities;
- flood management;
- recreation; and,
- infrastructure.

Upon completion by the Delta Protection Commission, the Economic Sustainability Plan shall be considered for inclusion in the Delta Plan by the Council. Authorities: Public Resources Code sections 29759, 29761.5(b), 29773(b); Water Resources Code section 85350.

DP P2. No covered action related to legacy towns will be consistent with the Delta Plan until the Delta Protection Commission has developed a strategy for the protection and preservation of legacy towns essential to maintaining the Delta as a unique cultural place, and such plan in whole or in part is incorporated into the Delta Plan. Authorities: Public Resources Code section 29759(b)(2); Water Code section 85307(b).

Delta as an Evolving Place Recommendations

The Delta Plan recommends that:

DP R1. The Council supports providing sufficient, reliable funds for the Delta Investment Fund to support implementation of the Economic Sustainability Plan upon inclusion in the Delta Plan. Authorities: Public Resources Code section 29778.5.

DP R2. The Council supports creation of a system of "payments in lieu of taxes" to replace a reasonable calculation of lost local government revenues resulting from the removal of properties from property tax rolls for ecosystem restoration or water supply purposes. The Delta Protection Commission should recommend to the Council a formula for such reimbursement, which may be included in the Delta Plan. Authorities: Public Resources Code section 29702.

DP R3. The State of California recognizes the Delta and Suisun Marsh as an important heritage and culturally unique place. The Council supports federal government designation of the Delta and Suisun Marsh as a National Heritage Area. Authorities: Water Code section 85301(b).

Chapter 9
Finance Plan to Support Coequal Goals

[Ed. Note: Preliminary version of the Finance Plan chapter is included in this draft for review. It is anticipated that this chapter will undergo substantial revision in subsequent versions of the Staff Draft Delta Plan.]

The Delta Plan will include a range of policies for conveyance, ecosystem restoration, levee improvements, science, and governance. The finance plan proposes financing strategies that will generate revenue for these policies, including ongoing operations and future capital improvements described in the Delta Plan. The finance plan is structured so coequal goals can be achieved; financing approaches for recovering ecosystem restoration costs are discussed, as are approaches for a more reliable water supply.

Many of the policies recommended in the Delta Plan will not be fully developed and more detailed costs will be determined at a later date. Project detail will eventually help to identify beneficiaries and allocate costs. Stressors will have to be identified as well as entities with legal obligations to contribute.

Other programs will include spending for Delta projects and programs. These programs will be integrated into a comprehensive approach to financing these improvements. These programs include:

- The Central Valley Flood Management Planning Program is preparing an integrated flood management plan called the Central Valley Flood Protection Plan, planned to be released in January 2012. This report will describe a system wide approach for protecting lands in existing flood zones from flooding by existing facilities of the State Plan of Flood Control, which includes portions of the Delta.
- The Bay Delta Conservation Plan has been delayed, so its recommendations on approaches for balancing water supplies and ecosystem will likely come after the Delta Plan is completed.
- Ongoing CALFED storage investigations by the Department of Water Resources and the Bureau of Reclamation.

This plan contains both mandatory "regulatory policies" and discretionary "recommendations." Covered actions must be consistent with this plan's regulatory actions. Covered actions are defined by Water Code section 85057.5, which among other things requires that the action "[w]ill occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh [Delta]." Where a covered action has a connection to out-of-Delta action(s), the covered action's consistency with this plan must include an evaluation of (1) whether the out-of-Delta action(s) significantly contribute to the need for the covered action, and if so (2) whether the out-of-Delta action(s) are consistent with this plan's regulatory policies. Where, however, a regulatory policy is directed to an out-of-Delta action that is not connected to a covered action as provided above, the regulatory policy is a discretionary recommendation as to that out-of-Delta action.

Background

Operations, maintenance and capital expenditures for water infrastructure consume a significant amount of resources in California. A cursory review of financial data for many of the major water entities found expenditures on water provision in California exceed $20 billion annually. Since the CALFED Bay-Delta Program was instituted in 1995 to restore ecological health and improve water management in the Delta, there have been significant expenditures in the Delta. Over $13 billion has been spent by federal, State, and local water users.

Traditionally the State has financed water infrastructure with General Fund obligation bonds supported by tax revenues. These bonds were approved by the voters and repayment is guaranteed by the State's general taxing power. For the State Water Project, however, even though guaranteed by taxes, general obligation bonds were paid back mainly by user fees. Since 2000, the State has issued close to $20 billion in general obligation bonds for water related purposes, spread over six separate bonds (not all of these bonds have been issued yet). A major aspect of financing water projects with general obligation bonds is costs are allocated to the public good (such as some ecosystem benefits) and are repaid by taxpayers, the primary beneficiaries.

With the State's current fiscal condition, access to the bond market has become more expensive. Coupled with the reduced likelihood of getting voter approval for general obligation bonds, new approaches to water infrastructure financing are needed. This also creates the need to find an approach to cover those ecosystem costs previously paid for by general obligation bonds.

Guiding Principles

As the costs of Delta improvements become known and the finance plan is refined, the plan should be shaped by a set of guiding principles. These principles are discussed below.

- The "beneficiary pays" principle is a common financing approach for water projects. Under this principle, project costs are paid for by those that benefit from them. The challenge here is to determine the beneficiaries and then develop a cost allocation methodology satisfactory to the assessed parties. While costs are being developed for improvements, discussions of cost allocation methodology with involved parties should begin, and cost sharing understood and agreed to by participating parties.

- A companion principle to "beneficiary pays" is "stressors pay." Human activity that causes negative operational or environmental impacts should be assessed a fee to pay for mitigation costs. An example of the stressors pay approach was the Bay Delta stamp that was required in order to fish in tidal waters of the Delta and the main stem of the Sacramento and San Joaquin Rivers.

- The finance plan should include a wide range of financing instruments. Diversity in financing will enhance revenue stability.

Financing Needs

The initial Finance Plan for the Delta Plan is divided into two categories: immediate needs over the next 5 years and near term expenditures that might occur through 2025. Elements of these categories are described below.

Immediate Needs

Operations funding for the Delta Stewardship Council is assumed through fiscal year 2011-12. Financing beyond that is uncertain. At this time it is assumed the Council would have only slightly increased staffing over the next 5 years. As the Delta Plan is developed and responsibilities and duties are further refined, resource levels will need to be adjusted.

Near Term Needs (2025)

Near term needs include ongoing studies and investigations, from the Bay Delta Conservation Plan (BDCP) to storage investigations. These studies are described below. The costs of the CALFED storage options represent the results of various plan formulation studies, with most of the projects in the midst of feasibility studies. Delta levee improvements costs were based on estimates from the Delta Vision studies. While all studies will be further refined and alternatives will change, it should be noted that it would not be unreasonable to assume that costs could easily exceed $20 million on new improvements.

BDCP Costs and Existing Funding Sources

Over the BDCP's 50-year permit period, $15.8 to $16.7 billion in capital costs and $4.9 to $5.6 billion in operating costs have been estimated. These costs are divided among the BDCP's four primary functions—water conveyance, habitat restoration, management of other stressors, and program oversight—as shown in Table 9-1.

Water Conveyance Funding

State and federal water contractors, and perhaps private companies, are expected to pay the costs for water conveyance and related mitigation.[20] Discussions on funding sources for habitat restoration, stressors, and program oversight are on-going. The BDCP has identified specific stressors; Delta Plan stressors may include these and more. Potential sources of existing State and federal funding for BDCP are described below.

Operations Criteria and Plan Biological Opinion Funding Overlap

Several of the conservation measures and programs that will be implemented under the BDCP partly or wholly address various actions required under the Operations Criteria and Plan (OCAP) Biological Opinions (BO). These include monitoring, research, and adaptive management programs, non-native predator control, non-physical fish barriers, tidal habitat creation, floodplain habitat creation, and Yolo Bypass improvements. According to the Department of Water Resources preliminary estimates, OCAP BO actions overlapping with the BDCP have a minimum expected implementation cost of $696 million. Of this total, $80 million is required under existing permits and/or agreements, and the remaining $616 million would constitute new funding obligations for State and federal project contractors. Expected OCAP BO expenditures by BDCP program function are summarized in Table 9-1.

[20] The preamble to Chapter 8 – Implementation Costs and Funding Sources – of the Steering Committee Working Draft of the Bay Delta Conservation Plan, dated November 18, 2010, states "No agreement on the apportionment of funding of the various components of this plan beyond the state and federal contractors' commitment to funding the new conveyance and related mitigation costs. Substantial public and other sources of funding are expected to contribute to the cost of implementing other elements of the Plan." (p. 8-1)

Table 9-1
Summary of BDCP Costs and Existing Funding Sources ($M)

BDCP Program Function	BDCP[a]			Water Contractor Funding	OCAP BO Expenditures	Potential BDCP Funding[b]			CALFED Cross-Cut Budget[f]	Residual BDCP Costs (Gap)
	Capital Costs	Operating Costs	Total			Prop. 50[c]	Prop. 84[d]	Prop. 1E[e]		
Water Conveyance	$12,691	$2,934	$15,625	$15,625			$18		$100	$0
Habitat Restoration	$2,557	$390	$3,947		$543	$4	$115	$178	$1,300	$1,807
Other Stressors	$13	$1,446	$1,459		$67	$6			$250	$1,136
Program Oversight		$477	$477		$86				$1,450	$0
Total	**$15,261**	**$5,247**	**$21,508**	**$15,625**	**$ 696**	**$ 10**	**$133**	**$178**	**$3,100**	**$2,943**

[a] Over 50 year permit period, in million dollars, midpoint cost estimate.
[b] Potential funding from existing State bond programs.
[c] Sections 79541, 795505(b) and 79550(e) of Proposition 50.
[d] Sections 75029(a), 75029.5, 75034, 75041, 75050(a), 75050(c), 75050(d), 75050(n), and 75055(c) of Proposition 84.
[e] Sections 5096.25 of Proposition 1E.
[f] 50-year funding total.

Existing State Bond Programs

There is limited funding through bond programs authorized by Propositions 50, 84, and 1E that may be available to fund some BDCP costs. This funding is summarized in Table 9-1. Most of the funds in these programs have been obligated to other purposes. However, there remain small amounts of unobligated funds in these programs that potentially could be used to fund BDCP. In most cases, these funds are allocated through competitive grant processes, and thus the BDCP would be competing with other interests throughout the State. The likelihood that all or even most of the unobligated funding would be channeled to the BDCP is therefore low. Some of the funds shown in Table 9-1 may have since been obligated to other projects.

Federal Funding for BDCP

Discussions regarding the amount of federal participation in BDCP continue. The CALFED federal cross-cut budget provides some indication of potential federal participation in BDCP. Table 9-1 shows the overlap between the fiscal year 2011 CALFED federal cross-cut budget and BDCP program functions, assuming that federal funding does not fall below fiscal year 2011 cross-cut budget levels during the 50-year BDCP permit period.

BDCP Funding Gap

The amount of unfunded BDCP costs after deducting potential funding from federal and State water contractors, OCAP BO overlap, existing State bond programs, and federal participation is summarized in Table 9-1. The estimate reflects a best-case scenario, because the likelihood that BDCP could secure all of the potential funding in existing State bond programs is low, and the level of federal funding shown in the table is strictly hypothetical. Given this, new funding sources of at least $3 billion and possibly much more are estimated to be required.

2012 Water Bond Funding for BDCP

The water bond slated to go before voters in 2012 contains significant amounts of potential funding for BDCP.

- Chapter 7, Section 79731, includes $1.5 billion for projects to protect and enhance the sustainability of the Delta ecosystem, including projects for the development and implementation of the BDCP.

- Chapter 9, Section 79755, provides not less than $215 million for the protection or restoration of watershed lands or rivers and streams that support species listed as threatened or endangered, consistent with requirements of programs identified in Division 2 of Fish & Game Code, and requirements to implement or develop Natural Communities Conservation Plans (NCCPs). Of this total, $25 million is encumbered for San Joaquin River Conservancy river parkway projects and $20 million is encumbered for watershed protection in Ventura County, leaving a residual of $170 million that could fund BDCP projects.

- Chapter 9, Section 79755, also includes $50 million for coastal salmonid restoration projects, $10 million for implementing the California Waterfowl Habitat Program, California Landowner Incentive Program, and Permanent Wetland Easement Program, and $50 million for projects in accordance with the California River Parkways Act of 2004.

- Chapter 9, Section 79760, provides $60 million for implementing projects authorized under Section 3406(b)(1) of the CVPIA that improve salmonid fish passage in the Sacramento River watershed.

CALFED Storage Investigations

Since the CALFED Record of Decision in 2000, the Department of Water Resources and the Bureau of Reclamation have continued to investigate the viability of adding storage to the Central Valley Project and/or the State Water Project. These investigations are reported in several Bureau of Reclamation studies, noted in Table 9-2. The costs shown are taken from the plan formulation reports. In each case, feasibility studies are ongoing for each project. Cost allocations have not yet been prepared for any of these projects.

Table 9-2
CALFED Storage Investigations ($1,000,000)

	Capital Cost		Operating Cost		
Project	**Low**	**High**	**Low**	**High**	**Source**
Upper San Joaquin River Basin Storage	$2,962	$4,045	$4.1	$5.2	Upper San Joaquin River Basin Storage Investigation Plan Formulation Report, October 2008, page S-12
Shasta Lake Enlargement	$531	$855	$3.7	$6.0	Shasta Lake Water Resources Investigation Plan Formulation Report, December 2007, page ES-6
Los Vaqueros Expansion	$596	$596	$3.5	$3.5	Los Vaqueros Expansion Investigation, Initial Economic Evaluation for Plan Formulation, July 2006, page ES-5
North-of-the-Delta Offstream Storage	$2,138	$3,036	$29.0	$40.0	North-of-the-Delta Offstream Storage Investigation Plan Formulation Report, September 2008, page ES-21
Total	**$6,227**	**$8,532**	**$40**	**$55**	

Delta Flood Control Costs and Existing Funding Sources

Costs for Delta flood control improvements were outlined in the Delta Vision Strategic Plan. There are also ongoing studies such as the Central Valley Flood Management Planning Program that could revise these costs estimates. The plan stated that costs could approach $4 billion to upgrade the Delta levees (Table 9-3).

In the Delta, flood management is under the jurisdictions of U.S. Army Corps of Engineers, Bureau of Reclamation, the State, and local agencies. U.S. Army Corps of Engineers funding is appropriated by Congress. In 2006, California voters approved two propositions that include funding for flood control. Proposition 84 includes $800 million for flood control, while Proposition 1E includes $4.09 billion for flood control. As of November 2010, Proposition 1E had $1.4 billion uncommitted funds.

In the Delta, the Department of Water Resources manages a Delta Levees System Integrity Program that receives funding from both Propositions 1E and 84. This program consists of two programs, the Delta Levees Subvention Program and the Special Projects Program. For nonfederal capital costs, the Flood Control Subventions Program can contribute a minimum of 50 percent to a maximum of certain nonfederal capital costs. The Special Projects Program provides funding assistance to local districts to protect water conveyance and water quality.

Table 9-3
Delta Flood Control Expenditures

Improvement	Miles	Cost Per Mile ($M)		Capital Cost ($M)	
		Low	High	Low	High
Upgrade Delta levees to HMP standard (Class 2)	1,115	$0.45		$502	
Upgrade Delta levees to PL 84-99 standard (Class 3)	1,115	$1.30	$3.50	$1,450	$3,903

Source: Delta Vision Strategic Plan, October 2008, table 2_2, page 116

Other Costs and Existing Funding Sources

The scope of the Delta Plan includes the BDCP primary functions, namely water conveyance, habitat restoration, management of other stressors, and program oversight, but it also includes some additional costs and functions. The BDCP habitat restoration and management of other stressors are included within the Delta Plan ecosystem component. Some of the BDCP program oversight is included within the Delta Plan science and monitoring component. The Delta Plan also includes water storage and levees.

The definitions and scopes defined by these processes can change over time, so the finance plan must be flexible to accommodate these differences and changes. There are other initiatives, processes, and trends that are related to the Delta Plan. For example, water use efficiency is not an explicit component of either the BDCP or the Delta Plan, but water use efficiency accomplishments are important to both processes, and water use efficiency projects may compete for available funds.

The Funding Challenge

The challenge in funding the Delta Plan is two-fold. First, the main funding source for the State's share of water resources planning and development costs has historically been general obligation bonds. However, given the State's poor fiscal condition and the uncertainty that future general obligation bonds will be approved by the voters, the Delta Plan must consider other financial mechanisms.

Second, the magnitude of the expenditures is considerable. Knowing that expenditures to rehabilitate and repair existing infrastructure will be substantial and then include near term needs, the financing challenge is much greater. Just financing rehabilitation of existing infrastructure will likely require a significant portion of any remaining traditional financing sources.

Funding Sources

Some potential funding sources that could be part of a financing strategy are described in this section. In developing the financing strategy, the approaches used by other major programs around the country were also explored. Some of the more innovative approaches are described here.

Capital Funding Sources

To implement the Delta Plan infrastructure improvements, and for financing habitat acquisitions and improvements, capital funding sources will need to be identified. Capital funding sources may include federal appropriations, State general fund appropriations, State issued debt, local debt, and private funding.

Federal Appropriations

Federal appropriations pay for taxpayers' share of capital costs and require the approval of Congress. Federal authorization already exists for several Delta programs and the challenge will be for Congress to appropriate funds annually. Similar to the State's financial condition, there are increasing demands from all sectors of the federal budget, which makes obtaining federal funding more difficult.

General Fund Appropriations

General Fund appropriations may pay for taxpayer share of capital and operating costs and may be used for any purpose. However, the State's fiscal condition will limit their availability in the future.

State Issued Debt

The State traditionally has issued two types of debt for water related infrastructure: general obligation bonds and revenue bonds. General obligation bonds must be approved by voters and their repayment is guaranteed by the State's general taxing power resulting in typically low interest costs. Revenue bonds do not require voter approval because they are secured by a designated revenue stream, such as water sales. Going forward, revenue bonds may be a preferred mechanism.

Local Government Debt

Construction expenditures might be funded by debt issued by local governments or water agencies. Depending on the type of project being financed, local entities may be able to issue debt based on their increased revenue streams or may be able to establish some type of improvement or assessment district.

Conservation Organizations

A variety of conservation organizations provide funds for land and water acquisition and management. The Nature Conservancy, for example, has been active in the region. Nonprofit organizations (IRS code 501(c)(3)) could be created to accept tax-deductible gifts that could be operated for Delta projects and programs.

Repayment and O&M Funding Sources

A finance plan requires identifying revenue sources to repay capital costs and to pay for ongoing operations, maintenance and replacement costs.

User Charges for Water

Water agencies generate revenue by selling water. Water sale revenues are normally used to recover water supply and quality costs including O&M expenses as well as debt repayment for infrastructure investments in facilities. The cost of developing new water supplies is usually factored into the price for all water supplies. However, water sale revenues are limited by the elasticity of demand. If demand is at all elastic (price responsive), then water users will take less water as price increases and water revenues may fall below expectations. Funding very large investments in new water supplies may exceed the capacity of current users given the economic returns they receive for water. This result is a common feature of markets. Allowing reallocation of resources among users may be required for the long term economic vitality of the State.

Fines and Forfeitures

Significant dollars are raised annually as the result of administrative and civil enforcement actions. Water Code section 13260 provides that the State Water Resources Control Board can collect fees to deposit in the Waste Discharge Permit Fund. For fiscal year 2008-09, revenues and expenditures were about $80 million. Most expenditure is for NPDES permit and storm water programs, and for waste discharge

requirements. Within these programs, most costs are for permitting, enforcement and compliance.[21] The Council should research the potential for assigning fees, fines and forfeitures generated from actions detrimental to the Delta directed to Delta activities.

Reallocating Funds

Given the number of agencies involved with Delta operations, funds might be generated by reallocating dollars among agencies.

Cost Efficiencies

Water supply and quality improvements, improved ecosystem health and levee improvements may result in verifiable cost savings. In general, such cost savings represent a potential source of funding for the Delta Plan. Additional studies are needed to determine whose costs and how much cost might be saved.

Carbon Offsets

Carbon markets are increasingly accepted by State and federal authorities and private markets as a means to offset carbon emissions. A seller can develop carbon offsets to be sold on the market. The offset can be developed based either on sequestration or reduction of greenhouse gas emissions. The cost of an offset has recently ranged from $8 to $30 per ton-year.[22]

Conversion of farmed Delta islands with peat soils to natural wetlands or water bodies could provide two types of offsets. The Delta subsides at a rate of 1 to 3 inches a year, mostly in the form of carbon dioxide releases (USGS Delta Subsidence in California: the Sinking Heart of the State). The amount of CO2 emissions from farmed Delta islands is 2.5 to 6.5 tons per acre per year.

When the land is converted to cattails or tules, this loss is stopped. Dead plant material, largely carbon, accumulates in the form of new peat soil. The U.S. Geological Survey has been measuring carbon sequestration on an experimental plot on Twitchell Island for about 15 years. The additional CO2 sequestered by cattails or Tules amounts to another 12 to 20 tons per acre per year using high and low ranges, potential revenue per acre is $100 to $800 per acre per year. It appears that CO2 offsets might repay a significant share of Delta island acquisition and wetland restoration costs. Net revenue of $200 per acre per year is worth about $3,000 to $4,000 per acre in net present value terms as compared to the cost of land which may be $3,000 to $10,000 per acre.[23]

There are a number of unresolved issues involving carbon offsets in the Delta. In particular, wetlands emit methane, a known greenhouse gas. The extent to which the greenhouse effects of methane emissions might offset carbon sequestration is unknown; U.S. Geological Survey research on this issue on Twitchell Island has been stopped for lack of funds.[24] Costs of management of the wetlands for carbon sequestration would have to be considered. Important costs for growing and transplanting tules might be required. Also, the future carbon price is very uncertain.

The NMFS Recovery Plan for Central Valley Salmon and Steelhead calls for the restoration of 80,000 acres of tidal marsh in the Delta.[25] This level of restoration might raise $8 million to $64 million annually to help pay for the costs of acquiring and maintaining these wetlands.

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[21] State Water Resources Control Board 2009. Annual Fees Report FY 2008-09. Report to the Legislature. December.

[22] http://www.offsetconsumer.org/providers/

[23] California Chapter American Society of Farm Managers and Rural Appraisers, 2007. 2009 Trends in Agricultural Lands and Lease Values. California and Nevada.

[24] Miller, Robin. 2011. USGS California Water Science Center, February 28.

[25] NMFS 2010. Central Valley Salmon and Steelhead Recovery Plan. 8.0 Implementation and Cost Estimates p. 189.

Carbon offsets from reduced water use could also be used to help finance water conservation. Energy savings are significant, especially in the south coast. An acre -foot of water delivered to the south coast requires roughly 3,000 kWh of electricity. It appears that revenues from CO2 offsets would not pay a large share of urban water conservation costs. Revenues of $6 to $20 an acre-foot are small relative to typical costs of water conservation practices.

User Fees and Stressor Fees

User fees and stressor fees are conceptually similar but somewhat different. User fees may be assessed because the user benefits from improvements funded by the fee. Stressor fees are justified because fee revenues are used to reduce unwanted stressors, and because the fees provide incentive to reduce stressors. User fees are collected based on amount of a resource used. Stressor fees are collected based on the amount of stressor released or caused. In either case, physical measurement of the amount of use or stressor is required.

Diversion Fees

Diversion fees are commonly assessed based on both use and stress. That is, diversions may benefit from expenditures, but they may also contribute to stress. The CVPIA Restoration Fund is financed by restoration fees per acre-foot of water provided for urban and agricultural use. The Restoration Fund is used to finance a large range of restoration activities required by the CVPIA and managed by the Bureau of Reclamation.

The State Water Resources Control Board collects fees to cover costs of its water rights program. Revenues for fiscal year 2010 are estimated to be $10.9 million based on charges of $100 plus 3 cents per acre-foot.[26] These revenues are deposited in the Water Rights Fund.

A number of factors limit the feasibility of additional diversion fees in California. In particular, water users adamantly oppose any new diversion fees, unless perhaps, the fees are developed by water users themselves. In 2005, for example, a letter from 39 water district and city managers to Governor Schwarzenegger included the following request:

> *…do not include CALFED user fees as part of the 2005-06 state budget. Any such proposal is entirely inappropriate, given that all versions of the CALFED needs assessment aired to date have avoided grappling directly with the "beneficiary pays" principle. CALFED cost allocations should be proposed only after CALFED has conducted an open public hearing process in which all stakeholders have had the opportunity to present testimony on appropriate beneficiary payments. Until this process has been completed, no financing plan for CALFED can be considered complete and ready for implementation as part of the state budget.*[27]

Existing laws, such as Proposition 218, limit the ability of any state or local government to establish new diversion fees. Enabling legislation would be required.

The potential for diversion fees is also limited by the inconsistency and lack of water diversion measurement in some places. Diversions are measured by a variety of methods and some diversions are not routinely measured. The costs of standardized measurement could be significant relative to the amount of fees collected.

There is no standard economic method whereby the equitable or efficient level of a diversion fee could be estimated. Several efforts in the past estimated the fees that could be collected if the fees were similar to

[26] State Water Resources Control Board, Board Meeting Session Division of Administrative Services, October 5 2010.

[27] Letter, to the Honorable Governor Schwarzenegger, Senators Perata and Ackerman, Speaker Nunez, and Assembly member May 11,2005.McCarthy

Bureau of Reclamation restoration fees. In 2000, one author estimated that average non-Central Valley Project contract diversions of 13.182 million acre feet with fee levels similar to Central Valley Project restoration fees could provide about $105 million in annual revenues.[28] In 2004, CALFED estimated potential fee levels per acre-foot-year of diversion would raise $25 million in annual funds based on "normal" non-Central Valley Project contract diversions of 16.522 million acre feet. These fee levels were $1.50 for all users, or $1.25 for agriculture and $2.50 for urban users, or $3.25 for Delta exporters and $1 for all others.[29] CALFED also estimated that a residential fee of $1 per month per household in the CALFED solution area could raise $106 million annually.

Fee revenue, however, would be reduced by demand response to higher prices caused by the fees. In general, urban fee revenues are not expected to be reduced much by demand response because 1) the size of the fee is likely to be small relative to existing prices, and 2) urban water demand is highly inelastic – the price increase causes a much smaller quantity demand reduction in percentage terms. The amount of revenue from agricultural diverters could be reduced significantly because the fees are likely to be much larger relative to existing prices and agricultural demand is less inelastic than urban demand.

Fishing Fees and Payments

From 2004 through 2009, recreational fishing within the Bay-Delta watershed below the first dam required a Bay-Delta Sport Fishing Enhancement Stamp. In 2009, about 300,000 stamps were sold at a retail cost of $6.30 and gross revenues were about $1.9 million. These funds were used to leverage a 75 percent cost share from the federal Sport Fish Restoration Act. In 2009, AB 1052 repealed the stamp.[30] The Council should consider supporting legislation to renew this funding source.

The BDCP plan for non-native predators would locate "hot spots" and support removals of non-native freshwater and striped bass. The sportfishing fee system might include payments for removal of undesirable species as well as charges for removal of desirable native fish. In the Pacific Northwest, the Bonneville Power Administration pays anglers for their catch of northern pikeminnow, a predator of juvenile salmon and steelhead. The program pays $4 per fish for the first 100 fish in a season and up to $8 per fish after 400 fish have been caught. Some individual anglers have received over $80,000 annually for their efforts.[31]

A stressors-based finance charge would collect fees based on removals of desirable species. In 2011, inland steelhead anglers are required to purchase a Steelhead Report Card at a cost of $6.48, and a North Coast Salmon Report Card costing $5.66 is required for all anglers taking salmon in the Smith River System or Klamath-Trinity River System.[32] Annual revenues from 2001 to 2006 from the steelhead card averaged about $200,000.[33] Any person fishing commercially for salmon in California must purchase a commercial fishing salmon stamp for $85. Similar fees might be collected when substantial salmon fishing is again allowed in the Bay-Delta system. In 2006, about 500,000 freshwater and 1 million saltwater days were taken for salmon fishing.[34] Revenue potential from recreational salmon cards is perhaps $500,000 to $1 million annually.

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[28] Wahl, Richard. 2005. Implementing a Broad-based Bay-Delta Diversion Fee. A Report to the CALFED Bay Delta Program. November 28, 2000.

[29] CALFED. 2004. CALFED Finance Plan. Presentation. December.

[30] http://www.dfg.ca.gov/fish/Administration/Permits/BayDeltaStamp/

[31] http://www.pikeminnow.org/info.html

[32] http://www.dfg.ca.gov/licensing/fishing/fishdescrip.html

[33] Jackson, Terry A. 2007. California Steelhead Fishing Report Restoration Card. A Report to the Legislature. CDFG, July.

[34] California Department of Fish and Game, 2010. Hatchery EIS/R Chapter 5. Recreation and Economics

Hydropower Fees

Fees could be collected from hydropower generators in the Bay-Delta system. The State Water Resources Control Board collects fees from licensed FERC projects of $0.017 per kilowatt capacity, and higher fees are collected from facilities that recently renewed their FERC licenses.[35] These fees must be used to cover authorized costs of the Water Rights Program. The potential for additional revenues from hydropower generators is unknown.

Other Stressor Fees

A variety of stressor fees might be used to help finance programs within the Delta Plan. The BDCP has maintained a list of "other stressors" that currently consists of eight items:

1. Methyl mercury,
2. Non-native aquatic plants,
3. Stockton deepwater ship channel dissolved oxygen (oxygenation),
4. Non-native predators,
5. Non-physical fish barriers (bubble barrier),
6. Hatcheries genetic management,
7. Illegal harvest reduction, and
8. Delta smelt conservation hatcheries.

These stressors are generally not the same stressors as those for which stressor fees might be applied. The discussion below does not utilize the BDCP meaning of stressors. Rather, stressors are any man-made environmental factors that contribute to the reduced survival of desirable species.

Seven types of stressor fees have been considered.

1. Water quality loading charge: charge measured pollutant loads in water discharges.
2. Land use charge: charge land use practices that contribute to stressors.
3. Retail sales fees: Charge retail sales of products that may become stressors.
4. Habitat alteration fees: charge existing or proposed land alterations that contribute to habitat stressors.
5. Special diversion fees: charge water diversions that contribute more than average to entrainment, stranding, or flow-related habitat loss.
6. Recreation use fees: charge for recreation that contributes to stressors.
7. Hatchery fees: charge hatcheries for management practices that damage Delta resources.

Of these seven stressor-based fees, the water quality loading charge appears to be relatively most feasible. The "polluter pays" principle is well established in law. Many waste dischargers already pay fees that are set by the State Water Resources Control Board and deposited into the Waste Discharge Permit Fund. For fiscal year 2008-09, revenues were about $80 million.

[35] State Water Resources Control Board, Board Meeting Session, Division of Administrative Services, October 5, 2010.

Most of the loads of some pollutants, ammonia and certain chemicals, in particular, come from known discharges where the amount of load can be measured. The cost of removing the stressors by another means may determine a fair and efficient charge level. There are important measurement and administrative costs, but these could be small compared to revenues.

The other stressor based fees are generally not as straight forward. For land use charges, a fee for land management practices that release methyl mercury, perhaps, the stressor being introduced is often diffuse, not well measured, and the amount may vary substantially based on location and local conditions. It may be unfair or expensive to set land use changes based on diffuse and hard-to-measure stressors. Proposition 218 procedures must be applied for stormwater fees, so they would likely apply to land use charges as well.

A charge on retail sales of stressor materials such as pesticides or fertilizers might also be problematic because materials are used in a wide variety of locations and situations. The legal feasibility of such charges is not clear.

There is good potential to establish charges for some types of habitat alteration practices; wetland conversions, for example. However, such charges might fall under Proposition 218. The special diversion charge would be difficult to justify because the amount of unusual damage via entrainment, stranding or flow habitat loss would often be difficult to quantify and value. Hatchery management fees might be inefficient compared to other efforts to improve hatchery practices.

The revenue potential from stressors fees is unknown, but not believed to be large. Also, it is likely that any stressors fees could be spent for a very limited range of activities that would benefit the persons paying the fee. There is some potential for revenues in the form of fishing stamps (probably less than $5 million annually) and additional water quality loading charges.

Water Marketing Fees

Water marketing fees would be applied to water transfers in the Delta watershed. These fees would be above and beyond any existing watershed diversion or export fees. The State Water Resources Control Board currently collects fees associated with change in water rights required for transfers.

The number of water transfers that occur between existing water agencies is not large compared to total statewide water use. During the drought years of 2008 and 2009, about 400,000 acre-feet of cross-Delta transfers were reported annually.[36] If such transfers paid a fee of $10 per acre-foot, revenues might be $4 million annually. However, the volume of transfers in most years would be much less than in 2008 and 2009.

Public Goods Charges

In 1996 a public goods charge for electricity was approved in California as part of the energy sector deregulation. The public goods charge is a fee applied to a utility bill to fund public-interest programs related to utility services. More recently, interest in a public goods charge for water has increased as a potential tool for achieving the objectives of AB32, known as "The Global Warming Solutions Act of 2006." ("Implementing a Public Goods Charge for Water"; Griffin, Leventis, and McDonald, July 2010). In a study prepared for the California Public Utilities Commission by the U.C. Berkeley, Goldman School of Public Policy, a public goods charge for water was proposed that consisted of a volumetric charge on individual water utility bills.

[36] Water Strategist, February 2009 provides 2008 summary, other 2009 issues for 2009.

While the design of a public good charge would need to be developed, given the passage of Proposition 26, a two-thirds vote would be required to implement it. A key advantage of the public goods charge is it could be structured to pay for ecosystem restoration costs.

Recommended Financing Strategy

The recommended financing strategy involves a mix of financing tools. Table 9-4 shows what tools would be available in the initial 5 years and what tools will need legislative approval to be ready for the out years. Many of these tools will take time to develop and will need the input from participating entities. The recommended strategies follow.

Initial Five Years

FP R1. Initially the Council should continue to pursue General Fund appropriations, especially for the operations of the Council. These funds could also be used for the State's share of levee improvements.

There are still some unobligated balances for previously authorized water bonds. They might provide some initial funding on projects.

The 2012 Water Bond contains significant amounts of potential funding for the Delta.

FP R2. Develop a fee for services provided by the Delta Stewardship Council. Some of the costs for the Council could be recovered from agencies seeking a consistency determination as well as other entities that interact with the Council.

FP R3. Federal appropriations should also continue to be pursued. Current appropriations are important and additional federal funding should be pursued where possible. Maximize the cost share for flood control improvements and rehabilitation funds for federal facilities.

FP R4. An infrastructure-for-water arrangement, where water users would pay for infrastructure that increases the system reliability. This is similar to the contributions that the water contractors are making for BDCP, but would focus on achieving increased reliability.

FP R5. Create a charitable organization for the Delta. Private donations may fund an endowment for funding ongoing activities.

Near Term (2025)

FP R6. Continue to investigate "stressor pays" fees and how they might be applied. These might include fees on dischargers to the Delta or fees associated with pesticide applications, etc. Since stressor fees are likely to modify behavior, it is recommended that the funds generated from stressor fees be used to fund one-time expenditures such as science grants or contribute to infrastructure.

FP R7. Explore a water diversion fee as well as a Delta export fee. These fees might also be considered similar to "stressor fees," as diversions create stress on the Delta. These fees could be applied to cover operations of the Council, Conservancy, and the Delta Protection Commission. As part of a package of these types of fees, explore creating a watershed use fee.

FP R8. Create a public goods charge (similar to the energy public goods charge created in 1996) that is a volumetric charge on individual water utility bills for urban customers, and a similar type of charge for agricultural users. A public goods charge would be a tool that could recover

ecosystem costs that were once paid with general obligation bonds, or could be used for State water management costs such as developing the California Water Plan Update.

FP R9. For flood control, approaches could include developing mandatory State flood insurance fees, creating regional assessment districts, and other approaches that integrate with other water funding programs. Developing large assessment districts could fund such activities as O&M and debt service. In some instances, these types of approaches would need new legislation, as Proposition 218 could become an issue because flood control costs are typically allocated on a property basis.

FP R10. Explore having revenue from fines and forfeitures directed to the Conservancy.

FP R11. Continue to investigate carbon offsets as a revenue source for Delta islands.

FP R12. Once a new revenue stream is developed, projects could be funded with State issued revenue bonds. It is anticipated that state general obligation bonds will not be available.

FP R13. Given the long term economic and fiscal challenges facing California and the necessity to use water most effectively to ensure the economic vitality of the state, the Council recommends the price paid by the user of a natural resource in California should, to the extent administratively feasible, cover the full costs of that natural resource use. Authority: Water Code section 85302 (d)(2).

Table 9-4
Delta Plan Financing Tools

	Initial 5 Years				Near Term			
Finance Tools	**Delta Agencies***	**Water**	**Ecosystem**	**Levees**	**Delta Agencies***	**Water**	**Ecosystem**	**Levees**
Available								
General Fund	✓			✓	✓			
Federal Appropriations		✓	✓	✓		✓	✓	✓
State GO Bond Funds	✓	✓	✓	✓				
Local Cost Shares		✓	✓	✓		✓	✓	✓
Needs Legislative Authority								
State Revenue Bond Funds					✓	✓	✓	✓
Watershed Use Fee	✓	✓	✓	✓	✓	✓	✓	✓
Fee for Water Conveyed Across Delta	✓	✓	✓	✓	✓	✓	✓	✓
Stressor Fees	✓	✓	✓	✓	✓	✓	✓	✓
Public Goods Charge	✓	✓	✓	✓	✓	✓	✓	✓
Water Market Fee	✓	✓	✓	✓	✓	✓	✓	✓
Fines and Forfeitures	✓	✓	✓	✓	✓	✓	✓	✓
Surcharge on Water Wastage	✓	✓	✓	✓	✓	✓	✓	✓
Carbon Offsets	✓	✓	✓	✓	✓	✓	✓	✓

*Delta Stewardship Council, Sacramento–San Joaquin Delta Conservancy, and Delta Protection Commission

Chapter 10
Delta Plan: Integration of Policies, Performance Measures and Targets, and Adaptive Management

This section is under development.