Governor Schwarzenegger:

The Sacramento-San Joaquin River Delta covers more than 1300 square miles. Its more than 60 “islands”, together with its natural channels and sloughs are the home to 750 species of plants and wildlife as well as 130 species of fish.

The Delta is the hub of California’s water delivery system, taking runoff from over 40 percent of California’s landmass and moving that water to farms and more than two-thirds of the state’s population.

It is a crown jewel of California—and the nation. And it is in crisis.

As this Task Force said in its first report in 2007, the crisis worsens each day. As it worsens, the threat of statewide economic and ecologic disaster increases.

You asked us in Executive Order S-17-06, to develop a plan to pull the Delta out of its ecological tailspin and devise a strategy to restore its environmental quality while ensuring a reliable system to move water around the state.

The Delta has been the subject of more than 40 years of study and 40 years of political deadlock. As a consequence, ecosystems have eroded, levees have deteriorated, fish populations have collapsed and our system of delivering water has become ever more precarious.

The disparate interests with a stake in the Delta have attempted for years to reach agreement on the Delta’s future. Those efforts, mostly recently the CALFED process, have failed.

This Task Force is keenly aware of that history and the peril California faces from continued failure.

Our first report charted a vision of a healthy future for the Delta. Of necessity, a healthy Delta cannot be addressed in isolation, which is why you asked us to consider a broad array of ecosystem, water and land use policies in California.

This Strategic Plan describes the specific steps needed to achieve that vision.

Most importantly, we recommended one co-equal goal: Restore the Delta ecosystem and create a reliable water supply for California.

Co-equal means exactly that—harmonizing a desired Delta ecosystem and the necessity to provide water to Californians. Recent court decisions reinforce that one can’t be done without the other.

As with our Vision, the recommendations in this Plan are inextricably linked. There won’t ever be a sustainable and reliable water supply without a vibrant Delta ecosystem. And the reverse is also true.

To achieve a healthy Delta and a more reliable water system for Californians, policy makers must:

1. Legally acknowledge the co-equal status of restoring the Delta ecosystem and creating a more reliable water supply for California.

2. Recognize and enhance the unique cultural, recreational, and agricultural values of the Delta as an evolving place, an action critical to achieving our co-equal goal.

3. Restore the Delta as the heart of a healthy estuary.
4. Promote water conservation, efficiency, and sustainable use.
5. Build facilities to improve the existing water conveyance system and, expand state wide storage, and operate both to achieve the co-equal goal.
6. Reduce risks to people, property, and state interests in the Delta by effective emergency preparedness, appropriate land uses and strategic levee investments.
7. Establish a new governance structure with the authority, responsibility, accountability, science support and secure funding to achieve these goals.

Our specific recommendations to reach these goals follow.

This Task Force completes its work after decades of water and ecosystem policy deadlock.

Over the years, local water agencies have pursued their own water solutions, some making remarkable progress. Federal and state agencies have offered fragmented but well-intended aid to the Delta ecosystem. California voters have approved several public works bonds, with major investments in clean drinking water, Delta levees and a host of water projects and water efficiency measures.

Even so, disputes still flare over water storage facilities and habitat restoration. Consensus on improving the existing Delta water export system remains elusive.

Through our co-equal goal, and the linked steps that go with it, the Task Force has tried to present a vision and strategy to break through our long years of water wars.

But even if every recommendation in this Plan is adopted, California cannot guarantee that it will rain heavily every year.

California cannot guarantee that deliveries under every water contract will be made in full every year—at least as long as the state continues to oversubscribe its water supply.

California cannot guarantee that water prices will always be low. In fact, the finite amount of it strongly suggests prices will rise sharply in the future.

California cannot guarantee that every endangered species in the state will be restored to its past abundance.

California cannot guarantee that the Delta will be free of threats of flood, earthquake or other natural disaster. Nor feasibly can the state promise to repair all levees and protect all current uses of neighboring land.

What California can do is embrace a practical near-term and decades-long strategy that, with hard work and good will by all parties, creates a healthier, more sustainable future for the Delta and our state.

Phil Isenberg

DELTA VISION STRATEGIC PLAN

Fifth Staff Draft

CONTENT HAS NOT BEEN APPROVED BY DELTA VISION BLUE RIBBON TASK FORCE OR DELTA VISION COMMITTEE

October 9, 2008

http://www.deltavision.ca.gov

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Table of Contents

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Executive Summary

When it was created by Governor Schwarzenegger's Executive Order S-17-06 in 2006, the charge of the Delta Vision Task Force was nothing less than to create a vision to repair the ecological damage to the Sacramento-San Joaquin River Delta and, then, prepare a strategic plan which would sustain the Delta in future decades while ensuring a reliable water supply for the two-thirds of California's population who depend in whole or in part on water from the Delta.

The Delta is both unique and essential.

Unique in that, at 1300 square miles, it is the largest estuary on the west coast of North and South America—a complex, interconnected ecosystem that is home to 130 species of fish and 750 species of plants and wildlife. It's an agricultural and recreational center.

The Delta is essential because its rivers and the miles of natural and man-made sloughs and channels are the lynchpin in how water is moved around California.

Without water conveyed through the Delta, several counties adjacent to the Delta would be immediately at risk. Soon, some Central Valley farms would lie fallow, cities west and south of the Delta would wither, and California's economy would run dry. The simple truth is, truly, that stark.

Both the Task Force's vision for the Delta and the following strategic plan are based on one co-equal goal: Restore the Delta ecosystem and create a more reliable water supply for California.

It is a co-equal goal because one can't be achieved without the other. Recent court rulings reinforce that fact.

As the Task Force's November 2007 Vision bluntly put it: The Delta is in crisis. The crisis worsens each day, posing a higher and higher risk that California's water delivery system will collapse.

The Delta is in an ecological tailspin. Invasive species, water pumping facilities, urban growth and urban and agricultural pollution are degrading water quality and threatening multiple fish species with extinction.

Urban development is reducing wildlife habitat today and foreclosing future opportunities to improve the ecosystem—and Delta water conveyance. The threat of catastrophic failure from earthquake, flood, sea level rise and land subsidence is painfully real and growing.

Risks to people, property, and state interests in the Delta have grown to intolerable levels. New levee policies, future-looking land use decisions, and far better emergency preparedness are needed immediately.

Compounding the crisis is that the current governance structure for water and the Delta has failed.

More than 220 federal, state and local government agencies have some jurisdiction in the Delta. Everyone is involved but no one is charge. A key strategy in achieving the Task Force's co-equal goal is creation of a new governance structure.

No single existing state, local or federal agency has needed legal authority or competencies to achieve the co-equal goal. Moreover, existing fragmentation of policies and projects guarantees continued failure in restoring the Delta ecosystem and in ensuring reliable water supplies for California.

The Delta also needs recognition of its uniqueness—and its importance to California and its economy. Essential to achieving the co-equal goal is officially designating the Delta's special status, supporting its agriculture, and planning for a vibrant regional economy of the future.

Accomplishing the co-equal goal also requires creation of a reliable water delivery system. As a central protection of that reliability the Task Force recommends, subject to further analysis, two channels—improving that now existing through the Delta and a second designed for conveyance—to carry water to export pumps. Increased storage capacity, surface and ground, plus changed operations are also required.

Finally, healing the Delta and creating a sustainable water supply requires a broad range of linked actions. Like the Task Force's co-equal goal, statewide efforts to conserve water and use existing supplies more responsibly directly influence success in the Delta. Some recommendations made here will have greater effect if integrated into statewide policies—the Delta is very important to success of salmon, for example, but improvements in habitats from river headwaters to the ocean will benefit this species. Institutionalizing the co-equal goals and enhancing capacity of the Department of Fish and Game, the State Water Resources Control Board and the Department of Water Resources should be pursued state wide.

Executive Order S-17-06 creating Delta Vision identified these same threats and inadequacies, directing the Task Force to recommend "public policy changes…recommendations on institutional changes…oversight, land use and implementation authorities." Comments received by Delta Vision suggest not all perceive these problems and resistance to change in policies and institutions is deep among affected interests. This Task Force believes the time is past for denial of crises and illusory hopes that past practices or institutions can meet the challenges of the future.

Although the strategies presented in this report will have effects over decades, conservation, water system efficiency, promoting regional self-sufficiency and Delta ecosystem revitalization are, in the near term, the most likely actions to improve California's water future.

To achieve the seven goals, the Task Force recommends 21 strategies and 71 actions, organized under the seven goals. Volume 1 of this Strategic Plan provides the context and justification of this Strategic Plan and an overview of its recommendations. Volume 2 provides full discussion of the strategies and recommended actions. A compilation of the goals, strategies, and actions is provided here.

Goal 1: Legally acknowledge the co-equal status of restoring the Delta ecosystem and creating a more reliable water supply for California.

Strategy 1.1: Make the co-equal goal the foundation of Delta and water policy making.

Action 1.1.1. Write the co-equal goal into the California constitution.

Action 1.1.2. Write the co-equal goal into statute, and incorporate the co-equal goal into the mandated duties and responsibilities of all state agencies with significant involvement in the Delta.

Action 1.1.3. Require the achievement or advancement of the co-equal goal in all water, environmental and other bonds that directly or indirectly fund activities in the Delta.

Goal 2: Recognize and enhance the unique cultural, recreational, and agricultural values of the Delta as an evolving place, an action critical to achieving our co-equal goal.

Strategy 2.1: Apply for federal designation of the Delta as a National Heritage Area, and establish a multi-site State Recreation Area in the Delta.

Action 2.1.1. Apply for the designation of the Delta as a federally recognized National Heritage Area by 2010.

Action 2.1.2. Create by 2010 a multi-site State Recreation Area in the Delta, combining existing and newly designated areas.

Strategy 2.2: Establish market incentives and infrastructure to protect, refocus and enhance the economic and public values of Delta agriculture.

Action 2.2.1. Create special Delta designations within existing federal and state agricultural support programs.

Action 2.2.2. Conduct needed research and development for agricultural sustainability in the Delta.

Action 2.2.3. Establish new markets for innovative agricultural products and enterprises in the Delta.

Strategy 2.3: Develop a regional economic plan to support increased investment in agriculture, recreation, tourism, and other resilient land uses.

Action 2.3.1. Charge the Delta Protection Commission with facilitating a consortium of local governments to create a regional economic development plan that addresses agriculture, recreation, tourism, and other innovative land uses.

Action 2.3.2. As part of the economic development plan, establish special enterprise zones at the major “gateways” to the Delta.

Strategy 2.4: Establish a Delta Investment Fund that provides funds for regional economic development and adaptation.

Action 2.4.1. Initiate the Delta Investment Fund with state funding

Action 2.4.2. Structure the fund so that it can accept revenues from state, local and private sources

Action 2.4.3. Place the Fund under the joint management of the Delta Protection Commission and a consortium of local governments.

Strategy 2.5: Adopt land use policies that enhance the Delta's unique values, and that are compatible with the public safety, levee, and infrastructure strategies of Goal 6.

Actions: See Goals 3 and 6 for actions to address this Strategy.

Goal 3. Restore the Delta ecosystem as the heart of a healthy estuary.

Strategy 3.1: Restore a large area of interconnected habitats—on the order of 100,000 acres—within the Delta and its watershed over time.

Action 3.1.1. Increase the frequency of floodplain inundation and establish new floodplains.

Action 3.1.2. Restore tidal habitats and protect adjacent grasslands and farmlands throughout the Delta, with active near-term pursuit of restoration targets.

Strategy 3.2: Establish migratory corridors for fish, birds and other animals along selected Delta river channels.

Action 3.2.1. Improve physical habitats along selected corridors by 2015.

Action 3.2.2. Provide adequate flows at the right times to support fish migrations, and reduce conflicts between conveyance and migration, by 2012.

Action 3.2.3. Immediately use the Central Valley Flood Protection Plan to identify areas of the San Joaquin River within and upstream of the Delta where flood conveyance capacity can be expanded.

Action 3.2.4. Use the National Heritage Area planning effort (see Strategy 2.1), beginning immediately, to identify ways to encourage recreational investment along the key river corridors.

Strategy 3.3: Promote viable, diverse populations of native and valued species by reducing risks of fish kills and harm from invasive species.

Action 3.3.1. Reduce fish kills in Delta pumps by instituting diversion management measures by 2009, implementing near-term conveyance improvements by 2015 (see Strategy 5.1), and relocating diversions (see Strategies 3.4 and 3.5).

Action 3.3.2. Control harmful invasive species at existing locations, and minimize or preclude their colonization of new restoration areas to non-significant levels, by 2012.

Strategy 3.4: Restore Delta flows and channels to support a healthy Delta estuary.

Action 3.4.1. Charge the Department of Fish and Game to complete recommendations for in-stream flows for high priority rivers and streams in the Delta watershed by 2012 and for all major rivers and streams by 2018.

Action 3.4.2. Develop and adopt management policies supporting increased diversion during wet periods, a joint effort of the State Water Resources Control Board, the Department of Fish and Game and the Department of Water Resources, and related federal agencies, to be completed by 2012.

Action 3.4.3. Adopt new State Water Resources Control Board requirements by 2012 to increase spring Delta outflow with implementation to commence no later than 2015.

Action 3.4.4. Adopt new State Water Resources Control Board requirements by 2012 to reintroduce fall outflow variability no later than 2015.

Action 3.4.5. Revise the State Water Resources Control Board's Vernalis flow objectives and the export criteria for the Central Valley Project and the State Water Project by 2012 for implementation in 2015 to increase San Joaquin River flows between February and June.

Action 3.4.6. Provide short-duration San Joaquin River pulse flows in the fall starting in 2015.

Action 3.4.7. Reconfigure Delta waterway geometry to increase variability in estuarine circulation patterns, by 2015.

Strategy 3.5: Improve water quality to meet drinking water, agriculture, and ecosystem long-term goals.

Action 3.5.1. Require the Central Valley Regional Water Quality Control Board to conduct three actions:

- Immediately re-evaluate wastewater treatment plant discharges into Delta waterways and upstream rivers and set discharge requirements at levels that are fully protective of human health and ecosystem needs.
- Adopt by 2010 a long-term program to regulate discharges from irrigated agricultural lands
- Review by 2012 the impacts of urban runoff on Delta water quality and adopt a plan to reduce or eliminate those impacts.

Action 3.5.2. Relocate as many Delta drinking water intakes as feasible to channels where water quality is higher, and that are away from sensitive habitats.

Action 3.5.3. Establish Total Maximum Daily Load programs by 2012 for upstream areas to reduce organic and inorganic mercury entering the Delta from tributary watersheds.

Action 3.5.4. Comprehensively monitor fish and wildlife health, beginning in 2009.

Goal 4. Promote water conservation, efficiency, and sustainable use.

Strategy 4.1. Reduce urban, residential, industrial, and agricultural water demand through improved water use efficiency and conservation.

Action 4.1.1. Improve statewide water use efficiency and conservation.

Action 4.1.2. Reduce urban per-capita water demand through specific recommended actions.

Action 4.1.3. Ensure the most efficient use of water in agriculture.

Strategy 4.2: Increase reliability through diverse regional water supply portfolios.

Action 4.2.1. Modify the Water Recycling Act of 1991 to add a statewide target to recycle a total on the order of 1.5 million acre-feet of water annually by 2020.

Action 4.2.2. Enact legislation now to encourage local water agencies to at least triple the current statewide capacity for generating new water supplies through ocean and brackish water desalination by 2020.

Action 4.2.3. Request that the State Water Resources Control Board set goals for infiltration and direct use of urban storm water runoff throughout the Delta watershed and its export areas by 2015.

Action 4.2.4. Request agencies to ensure that accurate and timely information is collected and reported on all surface water and groundwater diversions in California by 2012.

Action 4.2.5. Require, before 2015, that all water purveyors develop an integrated contingency plan in case of Delta water supply curtailments or drought.

Action 4.2.6. Create a regulatory framework that encourages efficient and integrated management of water resources at local, regional, and statewide levels, with a focus on specific actions.

Goal 5. Build facilities to improve the existing water conveyance system and expand statewide storage, and operate both to achieve the co-equal goal.

Strategy 5.1. Expand options for water conveyance, storage and improved reservoir operations.

Action 5.1.1. Direct the Department of Water Resources and other allied agencies to further investigate the feasibility of a dual conveyance facility, building upon the Bay Delta Conservation Plan effort.

Action 5.1.2. Direct the Department of Water Resources and other allied agencies to decide the size and location of new storage and conveyance facilities by the end of 2010. Develop a long-term action plan to guide the design, construction, and operation.

Action 5.1.3. Complete substantial development and construction of new surface and groundwater storage and associated conveyance facilities by 2020, with the goal of completing all planned facilities by 2030.

Strategy 5.2. Integrate Central Valley flood management with water supply planning.

Action 5.2.1. Change the operating rules of existing reservoirs to incorporate and reflect modern forecasting capabilities.

Action 5.2.2. Require the Department of Water Resources to immediately create a flood bypass along the lower San Joaquin River.

Action 5.2.3. Request that the Department of Water Resources encourage greater infiltration as part of watershed management planning.

Goal 6. Reduce risks to people, property, and state interests in the Delta by effective emergency preparedness, appropriate land uses and strategic investments.

Strategy 6.1. Achieve levels of emergency protection consistent with federal and state policies.

Action 6.1.1. Complete a Delta-wide regional emergency response plan by 2010 that establishes legally binding regional coordination.

Action 6.1.2. Immediately begin a comprehensive series of emergency management and preparation actions, beginning immediately.

Action 6.1.3. Complete a comprehensive analysis of the costs and benefits of highway protection strategies, and adopt a policy based on its findings by 2012.

Action 6.1.4. Complete a comprehensive analysis of the costs and benefits of infrastructure protection strategies. Adopt a policy based on its findings by 2012.

Strategy 6.2. Discourage inappropriate land uses in the Delta region.

Action 6.2.1. Immediately strengthen land use oversight of the Cosumnes/Mokelumne floodway, and the San Joaquin/South Delta lowlands.

Action 6.2.2. Immediately strengthen land use oversight for Bethel Island, the city of Isleton and Brannan-Andrus Island.

Action 6.2.3. Immediately prepare local plans for these five at-risk locations within the primary zone: Walnut Grove, including the residential area on Grand Island, Locke, Clarksburg, Courtland, and Terminous.

Action 6.2.4. Immediately form a landowner consortium to create a new land use strategy that fosters recreation, increases habitat, reverses subsidence, sequesters carbon, improves handling of dredged material and continues appropriate agriculture on Sherman, Twitchell, and Jersey Islands.

Strategy 6.3. Prepare a comprehensive long-term levee investment strategy that matches the level of protection provided by Delta levees and the uses of land and water enabled by those levees.

Action 6.3.1. Require the Department of Water Resources (DWR), in cooperation with local Reclamation Districts and other agencies, to develop a comprehensive plan for Delta levee investments.

Action 6.3.2. Appropriate $750 million from Proposition 1E and 84 funds for the improvement of Delta levees.

Action 6.3.3. Require those preparing the comprehensive levee plan to incorporate the Delta Levees Classification Table to ensure consistency between levee designs and the uses of land and water enabled by those levees.

Action 6.3.4. Continue the existing DWR levee subventions program until the comprehensive levee plan is completed.

Action 6.3.5. Vest continuing authority for levee priorities and funding with the California Delta Ecosystem and Water (CDEW) Council (new entity described in Strategy 7.1) to ensure a cost-effective and sustainable relationship between levee investments and management of the Delta over the long term.

Goal 7. Establish a new governance structure with the authority, responsibility, accountability, science support and secure funding to achieve these goals.

Strategy 7.1: Create a new California Delta Ecosystem and Water (CDEW) Council as a policy making, planning and oversight body. Create a new Delta Conservancy to implement ecosystem restoration projects, and increase the powers of the existing Delta Protection Commission. Abolish the existing California Bay Delta Authority, transferring needed CALFED programs to the Council.

Action 7.1.1. Enact legislation to create a California Delta Ecosystem and Water Council to replace the Bay-Delta Authority and take over CALFED programs.

Action 7.1.2. Create a California Delta Conservancy as early as possible in the upcoming legislative session.

Action 7.1.3. Strengthen the Delta Protection Commission through legislation.

Action 7.1.4. Require the California Delta Ecosystem and Water Council to create a Delta Science and Engineering Program and a Delta Science and Engineering Board by September 1, 2009.

Action 7.1.5. Improve the compliance of the diversions and use of water with all applicable laws.

Strategy 7.2: Create a California Delta Ecosystem and Water Plan to ensure flexibility and consistency among state, federal and local entities.

Action 7.2.1. Develop a legally enforceable California Delta Ecosystem and Water (CDEW) Plan.

Action 7.2.2. Institutionalize adaptive management through updates to the CDEW Plan every five years.

Strategy 7.3. Finance the activities called for in the California Delta Ecosystem and Water Plan from multiple sources.

Action 7.3.1. Enact a series of principles regarding design of financing into legislation authorizing the Council.

Action 7.3.2. Establish a base of revenues outside the state General Fund for the work of the Council, the Conservancy, the Delta Protection Commission and related

core activities of the Department of Fish and Game, the Department of Water Resources and the State Water Resources Control Board.

Action 7.3.3. Find new revenue sources beyond the traditional bond funds or public allocations.

Volume I

Context

This Strategic Plan outlines the major steps necessary to achieve our co-equal goals of a viable Delta ecosystem, and water for Californians. The Strategic Plan builds on our linked recommendations in our Delta Vision, adopted in November 2007, and shown in Figure 1.

Insert Figure 1-1 "Delta Vision Recommendations"

Of necessity, complex public policy issues involve many details. This Strategic Plan is no different. However, it is important to understand the context in which we present these recommendations.

The current political deadlock over water and the Delta ecosystem

This Task Force completes its work at the end of almost 30 years of water and ecosystem policy deadlock in California. During this period local water agencies have pursued their own water solutions, some making remarkable progress. Federal and state agencies have approved fragmented but well intended Delta ecosystem improvements. Several water bonds have been approved by the voters, with major amounts committed to clean drinking water, Delta levee protection and a host of water facility improvements and conservation/water efficiency measures. Not withstanding this effort, disputes over water storage facilities, and how or if to improve the existing Delta water export system are unresolved.

California is experiencing another drought and signs indicate it will not end any time soon. Why, given these realities, are we still blocked on broad water and ecosystem change? To anyone reading the history of this state, deadlock is not surprising.

Regional battles, competing plans for development, population growth, unrealistic attitudes about what amount of water is available in the state, lack of concern about adverse consequences from inappropriate uses of water—all have appeared frequently during the 158 years of our existence as a state. Those debates, and the solutions adopted by past generations, shape our water policy decisions today. In recent decades the growing body of federal and state environmental laws, and the broad public support for such laws in California, have forced a realization that current water policies and infrastructure do not protect the environment and no longer fully reflect our social values.

There are some signs, faint but still clear, that the warring parties are slowly changing their positions. Some urban water districts in the south acknowledge they are no longer asking for increased water from the Delta; some acknowledge reductions will occur. Some environmentalists acknowledge the Delta is deteriorating, but admit achieving fish populations that existed 100 years ago may not be possible. Conservation is increasingly important in this state, as best exemplified by the Governor's recent announcement of a policy goal of achieving a 20 percent per capita reduction in water use by 2020.

The current federal litigation about endangered fish species in the Delta is sobering. Periodic interruptions in water exports have occurred, and may be more frequent in the future. However, even court orders favorable to fish species cannot guarantee species will return to health.

All parties to the water debate have apparently concluded the Delta ecosystem is in decline and the current system of Delta and water governance is broken and needs to be fixed. Why has that happened?

Facts are stubborn things

More than 250 years ago, John Adams (later to be our second President), said

> *Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passion, they cannot alter the state of facts and evidence.*[1]

To understand why there may be a break in the water policy deadlock in California, let's start with some key facts.

- **California's supply of water is static; it is not growing.**

Almost 97 percent of all the water that comes into California is from rain and snowfall. In our Vision, and included in this Strategic Plan as Figure I-2, we referenced 116 years of rain and snow records to show that California's average water supply has remained constant. The chart is worth examining again.

Insert Figure 1-2 "History of California Precipitation"

- **Individual use of water indoors is moderating slightly in California, but the overall demands for water are increasing.**

The use of water inside homes has become significantly more efficient in recent decades, aided by technological improvements in toilets, showers, and faucets. However, population growth—which has primarily occurred in dry parts of the state that use water extensively for lawns, landscaping, and pools—has moderately offset the water conserved by efficient water use technologies.

Reliable information on water use in California is surprisingly sparse though better information is available on urban use than on use by agriculture, which uses far more water. Per capita urban water use in 1970 averaged 214 gallons daily; despite small declines in the 1980s from efficient technologies, urban water use averaged 225 gallons daily in 2000. In addition to small increases in per capita water use, population and industry growth doubled annual urban water use between 1970 and 2000. The Department of Water Resources estimates that, under current population and use trends, overall urban use will increase 33 percent by 2030.[2]

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[1] John Adams, November 27, 1770, quoted in The Trial of the British Soldiers of the 29th Regiment of Foot, for the Murder of Crispus Attucks, Samuel Gray, Samuel Maverick, James Caldwell, and Patrick Carr, on Monday Evening, March 5, 1770. (1824) Boston: William Emmons. 117. http://www.loc.gov/law/help/rare-books/pdf/john_adams_1824_version.pdf

[2] 1970 estimate based on average of regional per capita use rates, weighted for population, provided in Bulletin No. 166-2: Urban Water Use in California. (1975) Department of Water Resources, Sacramento. 2000 estimate is calculated the same way, with data provided in Bulletin No. 160-5: The California Water Plan Update 2005: A Framework for Action. (2005)

In 2000, California farmers irrigated nearly 10 million acres with over 30 million acre feet of applied water. As there are no institutionalized reports of agricultural water use, estimates are developed from expected application to crop pattern data obtained for other purposes. Moreover, many agricultural water users have access to both ground water on their property and water diverted elsewhere and conveyed to a water district of which they are a member. There is evidence that farmers are gaining more value from water used: between 1980 and 2000, inflation adjusted gross value per acre foot of applied water increased by 11 percent. Shifts to higher valued crops, such as orchards and vineyards continue. However, these shifts reduce land available to fallow under conditions of water shortage. Importantly for California water policy makers, there is no evidence that aggregate water use for agriculture is decreasing.[3]

Insert Figure 1-3 "Water Use"

Overall, these data reveal the challenges of providing water for California: population and economic activity increase resulting in growing demand for water with little evidence of successful conservation at a statewide scale.

- **The Delta ecosystem, by almost any measure, is in serious decline, and is further threatened by catastrophic failure from earthquake, floods, sea level rise, global warming, land subsidence and urban development. These ecosystem threats equally endanger the current Delta water export system.**

The evidence is overwhelming: the Delta ecosystem is in deep trouble and the problems are increasing. Invasive species, water pumping facilities, and urban and agricultural pollution are degrading water quality and threatening multiple fish species with extinction.[4] Encroaching urban development in the Delta is reducing wildlife habitat today and foreclosing opportunities to improve the ecosystem—and the Delta water conveyance system—in the future.[5] The levee system has eliminated the dynamic land-water interfaces crucial for aquatic and riparian plants and animals.[6]

- **Improving the Delta ecosystem is a legally required condition of improving the water delivery system for Californians.**

Over the last 40 years, the federal government and California have adopted a wide array of laws and regulations to protect our environment.[7] Many object to these laws and still call for repeal of the federal Endangered Species Act or the National Environmental Policy Act. In

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Department of Water Resources, Sacramento. 2030 estimate provided by Quantified Scenarios of 2030 California Water Demand. (2005) published for the California Water Plan Update 2005 by DWR.

3 Data from the Department of Water Resources, Water Plan Update 2009, working draft background documents.

4 (1) Sommer, T., et al. (2007), "The Collapse of Pelagic Fishes in the Upper San Francisco Estuary." Fisheries 32(6): 270-277. (2) California Resources Agency. (2007) Pelagic Fish Action Plan. Sacramento. (3) Lund, J., et al. (2007) Envisioning Futures for the Sacramento-San Joaquin Delta. San Francisco: Public Policy Institute of California.

5 (1) Eisenstein, W., et al. (2007) "Re-Envisioning the Delta: Alternative Futures for the Heart of California." Institute of Urban & Regional Development Working Paper Series, Paper WP-2007-01. (2) Department of Water Resources. (2007) Status and Trends of Delta-Suisun Services. Sacramento. (3) Mount, J., R. Twiss, and R. Adams. (2006) The Role of Science in the Delta Visioning Process. Public Review Final Report to the Delta Science Panel of the CALFED Science Program. Sacramento.

6 Florsheim, J., et al. (2008) "Bank Erosion as a Desirable Attribute of Rivers." BioScience 58(6): 519-529.

7 Bick, A., et al. (1999). California Environmental Law Handbook. 11th ed. R. Denney et al., eds. Rochester, MD: Government Institutes. See also: Delta Vision Blue Ribbon Task Force. (2007) "Context Memorandum: Delta Water Management Governance Structure." Sacramento.

spite of simmering political controversy, there is no sign Californians have lost their desire to protect the environment. In a recent decision regarding the protection of Delta smelt, U.S. District Judge Oliver W. Wanger declares,

> *The plain intent of Congress in enacting the Endangered Species Act was to halt and reverse the trend toward species' extinction, whatever the cost... Once the actions of an administrative agency in operating the CVP and a voluntarily appearing State Agency in operating the SWP, violate the ESA by endangering the species to the point where, as the undisputed evidence shows, it is critically imperiled and in imminent threat of extinction, the Court cannot balance hardships nor does it have any discretion, except to apply the mandate of Congress prescribed by the ESA... It is Congress that struck the balance in favor of affording endangered species the highest of priorities. It is up to the political branches of government, not the court, to solve the dilemma and dislocation created by the required application of the law.*[8]

This fact, in large part, dictated our conclusion that there are two co-equal goals that must drive water policy in California. Co-equal means just that: not secondary, not an afterthought, not something to be ignored until some pesky lawsuit forces water users to change, or government to act. No, we mean co-equal in the most important sense of the word; requiring a coherent effort to join a desired Delta ecosystem together with the effort to provide water to Californians.

- **Urbanization pressure will continue to grow in the Delta over the long term.**

Despite recent downturns in the housing market, demand for new development will continue to grow in the Delta over the coming decades. Population growth in California—and particularly in the Central Valley—shows no sign of abating. The Delta is a neighbor to dynamic job markets in the Bay Area and Sacramento, and offers affordability and open space amenities not readily available in those regions.

One estimate suggests that the five counties that include the Delta could more than double in population by 2050, from 3.7 million to 7.5 million people[9]—an increase equivalent to more than the entire population of Connecticut.

Without appropriate safeguards, growth of this magnitude would have enormous impacts on the Delta. Depending on where growth occurs, levee failure risks to existing communities could be increased, water quality could be harmed, and irreplaceable ecosystem restoration opportunities could be lost forever. It is critically important that better land use decisions be made in the future, and that the protection of the Delta primary zone and key locations in the secondary zone be enhanced.

- **The current system of governance has proven incapable of planning, developing and implementing any substantial new policy to provide water for Californians or protect the Delta ecosystem.**

The current governance 'system' of water and the Delta includes more than 220 federal, state and local government agencies! No person or group who submitted testimony to us

8 U.S. District Court, Eastern District of California. (December 14, 2007) "Findings of Fact and Conclusions of Law RE: Interim Remedies RE: Delta Smelt ESA Remand and Reconsultation." U.S. District Judge Oliver W. Wanger. Pages 41-2. www.fws.gov/sacramento/es/documents/OCAP_Court_Finding_of_Fact_12-14-07.pdf

9 Eisenstein et al (2007), p. 6.

supported the current governance system. Most acknowledge that no real 'system' exists: everyone is involved; no one is in charge.

All those who spoke to us about Delta governance said a change had to be made. It is not surprising, of course, that each interest group believes only they should control any new governance structure. We prefer and recommend a Governor-appointed, State Senate-confirmed public body representing a statewide perspective, possessing clear authority and needed tools, as we discuss further in this Strategic Plan. The single alternative proposal for governance received from a coalition of business and water interests recommends creation of this statewide body but with oversight roles only.

Some on the Task Force have suggested failure of policy-makers to achieve an agreed-upon approach to solving the water and Delta ecosystem problems of California will inevitably lead to federal and state court receiverships of the Delta and the water supplies that flow through the Delta. A court takeover of our water and ecosystem would be deeply undesirable, much like the recent federal court takeover of the California prison healthcare system.

The Task Force does not find this option attractive, however. Courts are constrained by the case brought before them, and they are limited in the remedies they can adopt. Powerful as courts are, they are no substitute for an informed, empowered and motivated public body that is committed to achieving clear goals.

Finally, it is worth mentioning some unrealistic expectations—call them urban myths—which influenced the water and ecosystem debates in California when it became a state 158 years ago. Ever since, legislatures, governors and the voters of California have adopted a large number of laws that appear to promise unrealistic amounts of water to every person, economic interest and region of the state.

In the closing days of our Task Force work, the State Water Resources Control Board presented us with startling conclusion that 8.4 times the average annual unimpaired flows in the Delta watershed have been promised to water users in the stated face value of permits issued! The face value of these water permits is 3.4 times the highest annual unimpaired flows reported. Even though these figures include some double counting, they do not include sizable riparian or pre-1914 water rights, suggesting far more water is promised than is available.[10]

All these promises exceed the currently available supply of water and expectations for increased water to continue. Additional, pending water right applications would divert an additional 4.8 million acre feet (MAF) of water within the Delta watershed. Though these applications are unlikely to result in granting of rights in the same order of magnitude, the applications do signal interest in receiving additional water, a drive unlikely to end given population and economic growth.

If there is a static water supply, together with statutory promises that exceed the available water supply, competing with a strong environmental ethic and facing continuing population growth, how does the state guarantee to provide more water than is available?

There is no particular secret to the answer. Over time, California has to do almost everything suggested by the major voices in the water wars. No, not every dam, canal or environmental spending project everyone can imagine; but some of each are required.

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[10]. State Water Resources Control Board. "Water Rights Within the Bay/Delta Watershed." September 24, 2008.

Strong conservation measures are necessary whether California builds dams or not. Greatly increased conservation, imposed both by local requirements and state mandates and resulting from incentives, seems inevitable, and desirable. Physical improvements of the existing water systems of California (federal, state and locally run), both in the Delta and around the State, are ways to help protect supplies from natural disasters, and promote the more efficient use of water throughout California.

Yes, water storage systems should and will be built; the cost will be high, but the benefited users will have to pay that cost. Yes, improvements in the Delta water export system will and should be made. The Task Force prefers a dual conveyance system, with a clear legal limit to total water export embedded in law. Capable, transparent governance committed to the co-equal goals of a healthy Delta ecosystem and reliable water supply, as proposed here, will address fears that water exports can trump ecosystem protection, allowing needed flexibility in water exports.

Likewise, our strong emphasis on water conservation and water system efficiency, as well as an optimization of regional self-sufficiency, illustrate that a relatively secure near-term water future is likely to come more from these steps than from state projects or facilities.

Californians are coming slowly to terms with the fact that water is not an unlimited resource. Perhaps in time desalination of ocean water will offer a new, currently unclaimed supply, but energy costs of desalination are now high and environmental impacts need to be addressed.

For the next decades, however, the Task Force believes that resolving the competing demands must rest upon good will, hard work, and a rational system of governance over water and ecosystem issues. Conflicts over water should be decided through effective use of California's water rights laws, which includes reasonable use and public trust principles.[11]

This recommendation, that Californians really apply existing water rights laws, may be the most far reaching recommendation made by this Task Force.

A demand for guaranteed outcomes

Add one additional point: All the interests who battle in the water wars want a legally enforceable condition or promise that "what I want done, gets done".

We wish to be clear about our Vision and our Strategic Plan. Even if every recommendation is adopted, and enacted into law:

- California state government cannot guarantee it will rain or snow heavily every year.
- California state government cannot guarantee that deliveries under every water contract will be made in full every year; certainly not as long as the water supply is over subscribed.
- California state government cannot guarantee that water prices will always be low. The finite nature of water strongly suggests water prices will rise dramatically in years to come.
- California state government cannot guarantee every endangered fish species in the state will be restored to a population level that existed decades ago.

[11] The public trust doctrine is recognized and analyzed by the California Supreme Court as a key component of state water rights law in National Audubon Society v. Superior Court (1983) 33 Cal.3d 419.

- California state government cannot guarantee the Delta will be free of threats of flood, earthquake or other natural disaster. Nor should the state promise to repair all levees, and protect all current uses of land, no matter the cost in dollars.

When a natural resource like water and the ecosystem is involved the ultimate guarantee is to use the best efforts of government to achieve the primary goals of its public policy. A higher level of protection than currently exists is what this Task Force strives to achieve.

In their hearts, all Californians know they live in one state. We are one people. California can solve these challenging water and environmental problems intelligently, but only if we are willing to be fully honest in public debates.

The Delta in Crisis

That the Delta is in crisis is no secret.

Over nearly two years of public hearings and deliberations, the point was made over and over again to the Delta Vision Task Force. It was made by Delta residents, Delta farmers, environmentalists, local government officials, scholars, scientists, state policy makers and water agencies from the north, south, east and west.

Strategies differed on how best to solve the crisis but there was unanimity in recognizing a crisis exists and that immediate action—as well as a sustained commitment over several decades—is essential to achieve the goal of restoring the Delta's ecosystem and ensuring a reliable water supply for California.

Many factors contribute to this crisis but it is compounded by lack of information to guide policy makers and lack of action.

- For example, the State Water Resources Control Board has issued permits for the diversion of water from the Delta to less than a third of those currently assumed to be doing so. The does not know how many divert water without permits.
- The 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.
- Neither the Department of Fish and Game nor any other state agency has yet established in-stream flow requirements for most of the Delta watershed, the foundation for effective ecosystem policy making.

It is against this backdrop that Governor Arnold Schwarzenegger created the Delta Vision Task Force through Executive Order S-17-06.

The Task Force's charge was to address increasingly visible crises in ecosystems, levee failure risks, and mounting uncertainty over the ability to provide water to the two-thirds of Californians who receive water from the Delta and its watershed. This Strategic Plan—and last November's Vision—represents completion of the charge.

At the center of the Task Force's work is one co-equal goal: Restore the Delta ecosystem and create a reliable water supply for California. It is a co-equal goal because neither restoring the ecosystem nor creating a reliable water supply can be achieved without the other.

During the same time period the Task Force has worked to find ways of achieving that goal, other governmental bodies were working to evaluate or develop plans for smaller pieces of the Task Force's larger puzzle. The Delta Risk Management Strategy assessed risks to Delta levees, and the Bay Delta Conservation Plan was initiated to harmonize Delta water exports and endangered species laws.

The urgency of these efforts has been magnified by growing recognition that existing institutions and policies are not addressing the Delta's challenges now, let alone in the future.

Intensifying conflicts

As the Delta Vision Task Force carried out its work, legal uncertainty about the ability to protect species and export water increased. Drought stressed water supplies. Water users throughout California have sued each other over the state's tightening supply. Figure 1-4 provides a time line of actions related to the Delta, showing the increased conflict.

Insert Figure 1-4 "Long-Standing but Intensifying Conflicts"

These are just some of the more significant events of the past two years that have fueled conflict over the Delta:

- In two high-profile legal cases, federal judge Oliver Wanger invalidated biological opinions and policies adopted by federal regulators to protect Delta smelt and several species of salmon and steelhead. Judge Wanger imposed interim remedies in the smelt case, to remain operative until a new biological opinion is issued. He has not yet ruled on the need for interim remedies for salmon and steelhead. Legal challenges to renewals of water contracts based on the rejected Delta smelt biological opinion were heard in late August 2008.
- A short-term voluntary shutdown of the state water project in the summer of 2007 to reduce killing of Delta smelt revealed the immediate impacts on Delta-reliant water users, mostly near the Delta, that can come with drastic pumping reductions.
- Precipitous declines continued in the populations of most major open-water (pelagic) fish species. Populations of the Delta smelt fell to a record low, sparking worries about extinction. In 2008, California took the unprecedented step of prohibiting salmon fishing statewide for the entire year to help salmon populations rebound.
- The California Fish and Game Commission identified longfin smelt as an endangered species candidate and adopted emergency regulations governing incidental take during the one-year candidacy period. The U.S. Fish and Wildlife Service (USFWS) took the first steps toward possible listing of longfin smelt under the federal Endangered Species Act.
- Two consecutive years of low precipitation and snow pack accumulation led Governor Schwarzenegger to declare an official drought in June 2008. He also declared a drought emergency in nine Central Valley counties one month later. Local water districts estimated between 250,000 and 275,000 acres of annual agricultural crops were fallowed in the Central Valley due to reduced water supplies from regulatory action and drought.
- Many water districts across the state urged conservation and some established mandatory water use reductions.
- Inter-regional legal disputes regarding the role of the Delta in water supply increased:
  - Five water agencies that rely on Delta water: Contra Costa Water District, Alameda County Flood Control and Water Conservation District, Metropolitan Water District of Southern California, Santa Clara Water District and Alameda County Water District used the California Environmental Quality Act to challenge the Sacramento Regional County Sanitation District's long term expansion plans.

- The Central Basin Municipal Water District in Los Angeles County sued over the drought water allocation plan adopted by the Metropolitan Water District of Southern California.

- The San Joaquin River Group filed a letter with the State Water Resources Control Board alleging illegal water diversions in the central and south Delta. This challenge alleges a pattern of overuse of water by Delta agricultural users.

While the crisis in the Delta accelerated over the past two years, those events are just the latest in a lengthy line of troubling developments. The impetus for creation of this Task Force stemmed, in part, from these key events.

- In 2003, the California Court of Appeal's *Paterno v. State of California* decision saddled the state with potential liability for the failure of any levee that is even partially state-financed or constructed, a dramatic financial exposure for California taxpayers.[12] The state passed a package of floodplain laws in the fall of 2007 to improve flood control throughout the Central Valley and reduce liability, but there is deepening concern that continued development in floodplains, such as the Delta, will increase risks and liabilities to the state as a whole.

- In 2005, Hurricane Katrina tragically revealed that even the relatively well-engineered levee system protecting New Orleans could be breached, with ruinous consequences. California policymakers subsequently acknowledged that Delta levees, in their current form, cannot protect against existing earthquake and flood risks, much less conditions exacerbated by future climate change.

- In 2005, the state's Little Hoover Commission concluded that the CALFED process, launched by the Bay-Delta Accords of 1994 and formalized by the CALFED Record of Decision in 2000, had failed to improve Delta sustainability. CALFED was criticized for its structure in which "no one level of government is fully in charge, or capable of responding in an orderly and effective way to address and mitigate the range of threats to the Delta."

Water crises around the world

What's happening in California's Delta is not an isolated event, as shown in Figure 1-5.

- The Colorado River Basin has just experienced an eight-year drought. As a result of this, and growing population and demands in the Upper Basin states like Utah, Colorado and New Mexico, the amount of water California is able to draw from the river has fallen 18 percent since 2003.

- Since 1990, the Missouri River system has been the focus of nearly a dozen lawsuits. The recent drought pitted upper and lower basin interests in multiple states against each other, and placed flood control and navigation against endangered species preservation. The federal government appears to be moving, albeit very slowly, to remove at-risk populations from floodplains, rather than simply paying to rebuild after periodic flooding.

- The Great Lakes-St. Lawrence River Basin faces an estimated $15 billion to $20 billion in restoration and cleanup costs associated with invasive species and raw sewage discharge. The eight states bordering the Great Lakes, working together with two

[12] Paterno v. State of California (2003) 113 Cal.App.4th 998.

Canadian provinces, recently signed an interstate compact for sustainable management of the lakes' watershed including provisions for more conservation, better reporting of water diversions, ground water management and limits on diversions outside the watershed. The compact is now pending before Congress.

- In late 2007, an extreme drought in the Southeast led to a water crisis in Atlanta and increased conflict over water among Alabama, Georgia, and Florida. Georgia imposed statewide water use restrictions. In May 2008, 55 counties remained subject to restrictions, under which most types of outdoor watering are prohibited. Landscape watering was limited to one person with one hose for 25 minutes per day on an odd-even schedule between midnight and 10am.

- Across the Atlantic, France, Germany, Britain, and the European Union have all approved major legislation in the past decade to try and balance the needs for flood control, surface and groundwater management, water quality, and endangered species.

- Sea level rise and flooding, especially of the Rhine River has driven the Netherlands by 2050 to return an estimated 220,000 acres to floodplains, natural forests, and marshlands, designate 62,000 acres of pasture as temporary floodwater storage pools, and require 185,000 acres of farmland to adopt land use practices that tolerate soggy conditions in the winter and spring. These three categories of changed land uses are six percent of the total land area in the Netherlands. The estimated cost is between $19 billion and $25 billion over the next 50 to 100 years.

- Australia has suffered its worst drought in 200 years, leading the federal government to take over the water rights of the four Murray-Darling Basin States, reduce the over-allocation of water resources, purchase water licenses from willing sellers, assist farmers in relocating, establish surface and groundwater caps, and change the water rights system to better reflect drought and climate change risks.

Insert Figure 1-5, "Global Water Crises"

Future Changes to the Delta

Delta Vision's charge is to create strategies that span decades. That means our recommendations must take into account future changes to the Delta. Many of these changes are beyond the state's control. Some are even global in nature. But responsible governance and management of the Delta must anticipate these changes if we are to secure the co-equal goal.

All of the following will have major impacts on the Delta.

Population growth will require greater efficiency and conservation

California's population will continue to grow substantially in the coming decades. The California Department of Finance expects the state's population to exceed 48 million by 2030—up from almost 38 million today. Some predictions say the Golden State will be home to 90 million by the turn of the century.

Within the Delta itself, population growth rates are projected to be even higher than in the state as a whole.

The population of the five counties that contain the Delta—Contra Costa, Sacramento, San Joaquin, Solano and Yolo—will more than double from 3.7 million people today to 7.5 million by 2050, according to demographer Hans Johnson of the Public Policy Institute of California.[13] The portions of these counties within or near the Delta's borders have been some of the state's fastest growing areas in recent decades, in part because they are within commuting distance of the Bay Area.

Unless major changes are made in how California's water is managed, demand for new water throughout the Delta watershed will also grow just as dramatically.

The State Water Resources Control Board reports that the face value of existing water rights permits in the Delta watershed is more than eight times the average annual unimpaired flows in the watershed.[14] Face values overstate actual water use for several reasons, but noting that pre-1914 and riparian rights are additional to these numbers suggests that the water resources of the Delta watershed are greatly over subscribed. The Board also has 4.8 million acre-feet of new water rights applications pending in the watershed—the equivalent of more than two-thirds the water that passes through the Delta annually. While some of these applications will not be pursued and others are unlikely to be approved, the level of existing demands further illustrates how acute the call on Delta water will be in future.

And, without major anti-pollution efforts, more Californians also means more contaminants washing into the Delta, further damaging water quality.

With expected statewide population growth of this magnitude—on the order of 500,000 persons each year—water conservation and efficiency must improve, throughout California.

Apart from new supplies ocean desalination may produce, there isn't a major source of new water in the state that can remotely meet future demand. Given that California's share of Colorado River water is declining—and with stresses on the Delta already unacceptably

[13] Quoted in William Eisenstein, Matt Kondolf and John Cain. ReEnvisioning the Delta. Berkeley: UC Berkeley Department of Landscape Architecture and Environmental Planning. 2006. page 6.

[14] State Water Resources Control Board. September 26, 2008.

high—sharply improved efficiency and development of alternative water supplies are the state's only choices.

Climate change heightens the Delta's challenges

Global climate change will have wide-ranging effects on California, even if emissions of greenhouse gases are reduced in the coming decades. Among the significant effects predicted for the Delta are:

- More critically dry years, increasing the need for large amounts of water to be moved and stored throughout the state during periods of relative abundance.
- A potential sea level rise of 55 inches by 2100, putting additional pressure on Delta levees and boosting tidal salinity intrusion.
- Wetter winters with less snow pack and smaller spring and summer inflows, making it even harder to repel salinity in the western Delta. Smaller inflows also hurt water quality because agricultural run-off and wastewater discharges will be more concentrated.
- Intense, warmer storms, raising the odds of flooding.
- Higher water temperatures in channels, potentially harming native fish species.
- Hotter temperatures in crop-growing regions, ratcheting up irrigation demands.
- Higher ocean temperatures, potentially altering marine food chains and further threatening salmon and other anadromous fish that migrate through the Delta.

Overall, climate change will exacerbate many of the Delta's most difficult challenges. The seasonal mismatch between the demand for and availability of water will widen. The conditions under which the ecosystem will need to be managed will become more uncertain. Figure 1-6 shows expected impacts of global warming relevant to water.

Insert Figure 1-6 "Global Warming Impact"

However, climate change could present new opportunities for the management of the Delta. Early experiments indicate that Delta soils could be extremely well suited to sequestering carbon. The state's efforts to reduce greenhouse gas emissions are expected to lead to a system under which carbon emission credits are traded, potentially creating a lucrative new industry for Delta farmers.

Subsidence and seismic threats will continue to mount

Land subsidence has already put most of the Delta's primary zone several feet below sea level. Levees, some in dire need of repair and reinforcement, are the thin line of defense preventing the Delta's islands from being permanently flooded. Subsidence is worsening on some islands because of soil oxidation, with large areas of the Delta expected to lose up to five more feet of elevation.

Subsidence of soils, coupled with a rise in sea level, will gradually exert greater and greater pressure on levees. The threat of levee failures will climb—as will the number of actual breaches and collapses—unless significant upgrades are made. Figure 1-7 depicts effects of subsidence on levees.

Insert Figure 1-7 “Effects of Growing Subsidence on Delta Levees”

Earthquakes also threaten the Delta and its levees. The U.S. Geological Survey estimates a roughly two-in-three chance that the Bay Area will experience a large-magnitude earthquake before 2032—most likely along one of the six faults that run near the Delta.

The Department of Water Resources and CALFED have estimated that such an event could cause up to 30 levees to break, flood thousands of homes and farms, and indefinitely interrupt water exports because of saltwater intrusion into the southern Delta. The cost to the California economy could run as high as $40 billion.

Seismic pressures build over time. The longer California goes without experiencing a major earthquake, the higher the probability the next one will be more devastating.

More invasive species will arrive

The Delta is already one of the most invaded estuaries in the world. New invasive species will continue to arrive. Almost 200 non-native species exist in the Delta representing at least 95 percent of the biomass.

Existing invasive species, particularly the clams *Corbula* and *Corbicula*, have profoundly altered entire food webs, harming the Delta’s native species. New invasive species will continue to appear. Quagga mussels and zebra mussels are of particular concern since they are voracious eaters of plankton, the base of the aquatic food chain. Many other species could also take hold in the Delta with unknown, but more than likely unfortunate, effects.

Energy prices will increase

The California water system both produces and consumes large amounts of energy. Over the next several decades, energy policy will change as prices rise and new carbon emission regulations take effect. The hydroelectric energy produced by dams in the Delta watershed will become increasingly important to the state.

At the same time, the energy required to move large volumes of water around the state will become more expensive. The State Water Project is the largest single consumer of electrical energy in the state.

Over the long term, the price of energy will directly influence the price of water and, in turn, influence the investment decisions of water consumers. Energy-intensive sources of alternative water supply, such as desalination, may become less attractive than more energy-efficient sources.

On the plus side, greater water conservation and efficiency tend to use less energy, increasing interest in those strategies as energy prices rise.

Strategies for a Better Future

The Delta is in crisis, and with it, the entire state of California confronts an unprecedented threat to its environment and prosperity.

If the Delta continues on its current path, California faces an ugly future of continuing environmental degradation and ever-tightening water supply restrictions. If the Delta were to experience a catastrophic failure—a major flood or earthquake, for example —California would face an environmental and economic disaster of massive proportion. Lives could be lost, tens of billions of dollars in damages would accrue and the Delta's environment and culture would suffer irreparable harm.

There can be no sustainable and reliable water supply without a healthy Delta ecosystem free of court-ordered, individual species protection actions. At the same time, the Delta ecosystem cannot remain healthy if the state's economy suffers for lack of water.

The Task Force's Vision recommended officially designating the Delta region as the unique and valued place it is. Doing so is essential to achieving that vision and to the Strategic Plan succeeding.

Using the Task Force's 12 Vision recommendations as a foundation, the Strategic Plan is premised on accomplishing seven broad goals.

1. Legally acknowledge the co-equal status of restoring the Delta ecosystem and creating a more reliable water supply for California.
2. Recognize and enhance the unique cultural, recreational, and agricultural values of the Delta as an evolving place, an action critical to achieving our co-equal goal.
3. Restore the Delta ecosystem as the heart of a healthy estuary.
4. Promote water conservation, efficiency, and sustainable use.
5. Build facilities to improve the existing water conveyance system and expand statewide storage, and operate both to achieve the co-equal goal.
6. Reduce risks to people, property, and state interests in the Delta.
7. Create a new governance structure with the authority, responsibility, accountability, science support and secure funding to achieve these goals.

The strategies in this Strategic Plan achieve these goals. All strategies must be carried out together to be successful. The recommended strategies and the reasoning behind them are summarized below. A more detailed discussion of each strategy is contained in Volume 2.

Goal 1: Legally acknowledge the co-equal status of restoring the Delta ecosystem and creating a more reliable water supply for California.

Strategy 1.1: Make the co-equal goal the foundation of Delta and water policy making.[15]

[15] All strategies below also contribute to achieving this goal.

Goal 2: Recognize and enhance the unique cultural, recreational, and agricultural values of the Delta as an evolving place, an action critical to achieving our co-equal goal.

Strategy 2.1: Apply for federal designation of the Delta as a National Heritage Area, and establish a multi-site State Recreation Area in the Delta.

Strategy 2.2: Establish market incentives and infrastructure to protect, refocus and enhance the economic and public values of Delta agriculture.

Strategy 2.3: Develop a regional economic plan to support increased investment in agriculture, recreation, tourism, and other resilient land uses.

Strategy 2.4: Establish a Delta Investment Fund to provide funds for regional economic development and adaptation.

Strategy 2.5: Adopt land use policies that enhance the Delta's unique values, and that are compatible with the public safety, levee, and infrastructure strategies of Goal 6.

There is nowhere in the world like the Delta. Every Delta resident enthusiastically attests to that. So do first-time visitors, boaters, sport-fishers and picnic-ers.

Located within minutes of major urban areas, the Delta feels like another world. A world of gorgeous sunsets, a world in which a step outside the front door leads to water skiing, fishing, kayaking or any other water sport.

It's 1,000 miles of navigable waterway— once plied by some 300 steamboats—meander from Sacramento to San Francisco Bay. It's rivers and its labyrinth of sloughs and channels are home to 170 species of plant and wildlife as well as 130 species of fish. Of California's salmon fisheries, 80 percent are in the Delta.

The Delta's history is rich. Locke, one of the Delta's many unique hamlets, is the only town in the United States built by Chinese for Chinese. The Locke of 2008 is physically nearly the same as the Locke of 1920.

In Isleton, Rio Vista, Walnut Grove, Courtland, Clarksburg, Oakley, Freeport, Knightsen and Bethel Island that sense of history and cozy timelessness is repeated.

The Delta's 60-some islands are home to farmers, some whose families have worked the peaty soil for more than a century as well as the sites of historic buildings like the Grand Island Mansion and the Ryde Hotel.

Delightful dive bars, out-of-the-way marinas, gracefully aging drawbridges and restaurants like Giusti's with its 1,500 hat ceiling and slips for diners who arrive by boat lie up and down the many turns of State Highway 160 and State Highway 4.

In summary, Delta's value is far greater than its environmental and economic worth to the state. It is a community with a distinct natural and cultural heritage. The Delta should continue to thrive not only as the hub of the state water system and the West's largest estuary, but for its own sake. Figure 1-8 is a map of the Delta.

Insert Figure 1-8, Map of Delta

These five strategies recognize the Delta's uniqueness and protect its future.

First, the Delta should be designated a Natural Heritage Area by the federal government. Doing so communicates its stature as one of America's most distinctive and culturally significant regions. California should also create a major new State Recreation Area, encompassing multiple sites, in the region, and provide incentives to enhance recreation and tourism.

Second, the state should assist Delta agriculture. Farmers are inventive. They know their lands and markets, and continually make decisions regarding what to produce. The Delta's unique soils, growing conditions, and farming traditions favor innovative types of agriculture such as carbon sequestration crops, subsidence reversal crops, wildlife-friendly crops, and crops for direct marketing to the large urban populations nearby.

Delta agriculture is the heart of the regional economy and central to the Delta's culture and sense of place. The broader the base of agricultural enterprises, the more diversified and resilient the local economy will be. Though landforms and water quality conditions in the Delta will ultimately change due to sea level rise, earthquakes or other forces, the Delta's traditional agriculture can, and should, remain robust.

Third, the Delta's changing regional economy should continue to grow in the coming decades. A major regional economic development plan should be created to chart a course toward prosperity for each of the major industries in the region. The Delta's potential to become a major recreational destination for the millions of people who will move to Northern California is virtually unlimited. The necessary investments to promote tourism and recreation should be concentrated in locations above sea level or where levee failure risks are low.

Fourth, the Delta is facing a future characterized by natural changes and substantial risks to residents and property. Planning processes for improved water conveyance and improved ecosystem function affecting the Delta are underway and will cause additional changes in landforms, water flows and uses in areas of the Delta. Separate from these initiatives, a major assessment of levees and flood management has begun and is also expected to propose changes in the Delta.

Even if no Delta ecosystem restoration is undertaken and no changes are made to the way water is transported through the Delta, natural events will bring floods or sudden levee failures that change the Delta. Successful adaptation to these changes and risks will require resources beyond those which can be provided by local governments and Delta residents and land owners. Indeed, state assistance in levee repairs is already important. The recommended Delta Improvement Fund would provide a structure for state support of economic development and adaptation to change.

Finally, land use policies in the Delta must change in order to protect people, property, and state interests in the region over the coming decades. Development in deep floodplains and below sea level, which is hazardous for new residents and existing communities, has not been adequately constrained. Our recommendations in Strategies 3.1, 6.2 and 7.1 would increase oversight of particularly hazardous portions of the Delta, and help to preserve the Delta's unique values as a place.

Goal 3: Restore the Delta ecosystem as the heart of a healthy estuary.

Strategy 3.1: Restore a large area of interconnected habitats—on the order of 100,000 acres—within the Delta and its watershed over time.

Strategy 3.2: Establish migratory corridors for fish, birds and other animals along selected Delta river channels.

Strategy 3.3: Promote viable, diverse populations of native and valued species by reducing risks of fish kills and harm from invasive species..

Strategy 3.4: Restore Delta flows and channels to support a healthy Delta estuary.

Strategy 3.5: Improve water quality to meet drinking water, agriculture, and ecosystem long-term goals.

The Delta was originally a vast, sea level tidal marsh intermixed with large areas of open water, surrounded by seasonal floodplains and grasslands. Strong seasonal pulses of fresh river water and twice-daily infusions of nutrients from the tides fed these habitats. Over time, natural islands developed.

Phenomenal numbers of birds, fish and wildlife lived in this ecosystem, either for their entire lives, such as the Delta smelt, or on their migrations between far-flung habitats, such as the Chinook salmon or the birds of the Pacific Flyway. The blending of the rivers and tides—and the particular land structures and water flow patterns that resulted—made all of this possible.

A full-scale restoration of an eighteenth century Delta ecosystem is both impossible and undesirable. At the same time, it is not adequate merely to return the Delta to the ecological conditions preceding the major fish crashes of recent years. California's task is to restore the underlying ecosystem structures, functions and processes in order to make a thriving Delta ecosystem possible in the 21st century and beyond. Such an ecosystem must possess five key characteristics:

- Viable populations of native resident and migratory species
- Functional corridors for migratory species
- Diverse mosaics of habitats and ecosystem processes
- Water flows to support habitats and processes
- Significantly reduced threats and stresses on the environment

Revitalizing the ecosystem to meet these five key characteristics requires a suite of interrelated strategies. The strategies of restoring habitats, reducing environmental threats and establishing corridors must be married with the strategies of achieving improved Delta flows to support the co-equal goal and the implementation of adaptive management procedures.

Revitalizing the Delta ecosystem on a large scale requires restoring each of the habitats that existed in the historic Delta—tidal marshes, floodplains, seasonal grasslands, small areas of open water—and ensuring appropriate connections between them wherever possible. These restorations will take place over many decades and, in many cases, will not require changes in current agricultural land uses. Figure 1-9 contrasts the natural branching "dendritic" pattern of channels in the south Delta in 1973 with the man-made "cross-cuts' typical today. Figure 1-10 is a cross section of typical tidal marsh.

Insert Figure 1-9 (now 1-12) and Figure 1-10

True revitalization of the Delta ecosystem will entail improvements to all these habitats, each of which require specific land elevations or other conditions if they are to thrive. To achieve the co-equal goal and sustain the Delta's environment for future generations, these restorations must begin immediately in carefully identified locations in order to create a foundation that can be built on in the future.

Migratory corridors for fish, birds and other wildlife must also be enhanced in the near future. Salmon and other migratory fish rely on the Delta for passage to and from key spawning sites on the Delta's tributary rivers. Millions of birds, some of which are protected by federal law and international treaty, travel through, and winter within, the Delta. These species require proper habitat conditions if they are to continue to thrive. All resident and migratory fish species should also be protected from the effects of invasive species and entrainment in water project pumps.

Finally, as conflict over the Delta has intensified, major court rulings have made clear that a "mitigation only" approach is not sufficient to restore the Delta's health or create a reliable water supply.

Comprehensive ecosystem revitalization is a far sounder long-term strategy for achieving that goal because it better supports diverse species, better copes with major disruptions, and better adapts to changes such as sea level rise or increases in temperature. An effective ecosystem revitalization strategy should also reduce future listings of species as threatened or endangered.

California must develop a system in which scheduling, permitting, and financing of major water supply and ecosystem projects are linked. Specific goals related to water use efficiency and facilities are detailed later in this Strategic Plan, but to achieve the Task Force's primary goal requires intensive management of two issues in particular—freshwater flows and water quality.

Appropriate freshwater flows trigger reproduction and migration of species, spread nutrients and organisms throughout the estuary, improve water quality, and promote a complex and diverse habitat. Water movement in the Delta has been homogenized over time by human regulation of inflows, high water exports, and the substitution of natural channels by man-made canals, especially in the south Delta.

Freshwater flows in the Delta are now not only the result of nature but also of decisions of operators of reservoirs and water systems. Those decisions are made within the framework of State Water Resources Control Board D-1641, which regulates flows and water quality at multiple points and under specific time periods.

Flow standards will also be developed in new Biological Opinions for Delta Smelt and Salmon to replace the opinions found inadequate by Judge Wanger.[16] Over time, flow standards should be set through adaptive management processes rather than just permitting requirements.[17] The Department of Fish and Game Administrative Draft

[16] Natural Resources Defense Council, et al., v. Kempthorne, , No. 1-05-CV-01207-OWW (TAG), December 14, 2007, 2007 WL 4462395 (E.D.Cal); Pacific Coast Federation of Fishermen's Associations v. Gutierrez, No. 1-06-CV-00245-OWW (TAG) May 20, 2008, 2008 WL 2223070 (E.D. Cal.).

[17] The public trust doctrine provides the foundation for policy making in adaptive management of needed flows: "The state as sovereign retains continuing supervisory control over its navigable waters and the lands beneath those waters. This principle,

Ecosystem Restoration Program (ERP) Conservation Strategy for the Delta and Suisun Marsh discusses flows as follows:

- In general, theory and experience show that the more water left in the system (i.e., that which flows through the Delta into Suisun Bay and eventually the ocean), the greater the health of the estuary overall.

- The desired pattern of freshwater westerly flow through the Delta would more closely emulate the natural hydrograph than the current flow patterns. This may include a fall or early winter pulse that emulates the first "winter" rain and elevated late winter and spring flows…These improved flows are particularly important in normal and dry years.[18]

A shift from the traditional process of proposing a project and then mitigating its effects is necessary. The Task Force urges moving toward a comprehensive ecosystem approach which will develop adequate flow standards and policy based on more than mitigation calculations.

The Ecosystem Restoration Program (Administrative Draft) prepared by the Department of Fish and Game for CALFED is one start toward an ecosystem policy. The current draft frames policy choices in an ecosystem perspective similar to that advanced here, but has not reached recommended targets or projects which would implement a policy. That is required. The recommendations below on governance propose a structure and processes that will ensure completion of this work. Actual implementation of flow targets as legally binding regulation is the responsibility of the State Water Resources Control Board.

Improved water quality is also key to reaching the Task Force's co-equal goal. Some contaminants, such as mercury, agricultural pesticides and urban runoff degrade water quality for both the ecosystem and water users. Chief among strategies for improving water quality is more elimination of contaminants at the source.

Among other water quality strategies are increased flexibility in managing flows, and moving intakes for water diversions to locations away from habitats where the amounts of organic carbon should be increased.

Goal 4: Promote water conservation, efficiency, and sustainable use.

Strategy 4.1: Reduce urban, residential, industrial, and agricultural water demand through improved water use efficiency and conservation, starting by achieving 20 percent conservation per capita by 2020.

Strategy 4.2: Increase reliability through diverse regional water supply portfolios.

California has made limited strides in water use efficiency and conservation in recent decades, mostly due to the efforts of some local and regional water districts. Their success proves the effectiveness of conservation and efficiency and reinforces the reasons the use of these strategies should be aggressively expanded. The California Constitution's

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fundamental to the concept of the public trust, applies to rights in flowing waters..[I]t prevents any party from acquiring a vested right in a manner harmful to the interests protected by the public trust…The state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect the public trust uses whenever possible." National Audubon Society v. Superior Court (1983) 33 Cal.3d 419.

[18] Department of Fish and Game. Ecosystem Restoration Program (ERP) Conservation Strategy for Stage 2 Implementation. Sacramento-San Joaquin Delta and Suisun Marsh and Bay Planning Area Version 2.2 (Administrative Draft). August 18, 2008. 23-26.

reasonable use doctrine provides the foundation for needed policy making regarding water supply and allocation.[19]

The use of water inside homes has become significantly more efficient in recent decades, aided by technological improvements in toilets, showers, and faucets. However, population growth—which has primarily occurred in dry parts of the state that use water extensively for lawns, landscaping, and pools—has moderately offset the water conserved by efficient water use technologies.

Dramatically improved water use efficiency, conservation, and alternative supply development must be the bedrock of California policies at the local, regional, and state levels. Among the Task Force's key recommendations in this area is legislation to require urban retail water users and buyers to reduce per capita water use by 20 percent by the end of 2020 and 40 percent, especially in non-coastal areas, by 2050. Increased efficiency in water use is imperative because precipitation is not growing. Figure 1-2 shows that the last 30 years are the wettest on record.

Diversions from the Delta watershed—upstream, within, and exported from the Delta—are an issue of statewide importance and directly impact restoration of the Delta and the reliability of the state's water supply. With population continuing to grow, demand for these diversions will grow as well, increasing pressure on the Delta and its tributaries. One of our recommended strategies calls for linking state funding for water projects of all kinds to achievement of specific benchmarks on efficiency, conservation, and development of alternative supplies.

Reducing the demand for water is California's first—and least expensive—option in meeting its water challenges. The specific opportunities available will vary widely across the state. The per capita rates of consumption and the economic uses of water differ greatly by geographic area, and therefore the conservation and efficiency investments that make economic and social sense vary regionally as well. That is why such investments decisions must occur at the local and regional level. The state's role is to provide broad policy guidance and ensure, through funding mechanisms and other means, that state policy goals are being met. Figure 1-11, "California Water Supply and Uses" shows broad categories of supply for wet, normal and dry periods of precipitation and uses by urban, agricultural and environmental purposes.

Insert Figure 1-11, from DWR, which was used in the Vision, on the back side of the table of contents.

Conservation and efficiency by themselves will not resolve California's water issues. Alternative supplies, such as reused water, recycled water, stormwater, and desalinated water must play a much greater role in the state's water supply portfolio.

Regional self-sufficiency is another important principal to guide the management of regional water supply portfolios. The more each region of California can rely on local supplies, the

[19]. On reasonable use, the "Racanelli" decision, interpreting and applying the reasonable use doctrine to the Delta, similarly provides this guidance: "All water rights, including appropriative, are subject to the overriding constitutional limitation that water use must be reasonable. (Cal. Const., art. X, sec 2; [Water Code] sec. 100...The [SWRCB] is expressly commissioned to carry out that policy." United States v. State Water Resources Control Board/ (1986) 182 Cal.App.3d 82, 129.

less stress is placed on the Delta ecosystem as a "switching yard" for huge quantities of water. Through its Integrated Regional Water Management Plan, California already recognizes that localized alternative supplies are preferable to moving stored water long distances. Regional self-sufficiency must be balanced, however, with diversification. Water users cannot protect against disrupted local water shortages or system outages by relying solely on local supplies. Harmonizing regional actions with broader needs will also be important to avoid Balkanization of regional actions which fail to meet the state's need for ecosystem function or water supplies. The Department of Water Resources must play key roles here.

Conservation, efficiency, and alternative supplies all have one critical thing in common—they are highly reliable. Once the initial investments are made, these strategies become very predictable and stable components of a water supply portfolio. That is obviously not the case with supplies diverted from the Delta watershed or other major systems such as the Colorado River.

In the coming century, the most reliable—and therefore the most valuable—water supplies will be those that can be obtained with the least damage to the environment.

Goal 5: Build facilities to improve the existing water conveyance system and expand state wide storage, and operate both to achieve the co-equal goal.

Strategy 5.1: Expand options for water conveyance and storage by building new facilities and improve reservoir operations.

Strategy 5.2: Integrate Central Valley flood management with water supply planning.

California's climate is highly variable. Native aquatic ecosystems, including the Delta, have learned to adapt to that variability. Human water users, however, demand predictable and consistent access to water. Although the demand for certainty is reasonable, there is no way that the state or federal government can guarantee to deliver water that is not available. Learning to deal honestly with constraints and competing demands for water is essential.

Water must be moved and stored when it is least harmful to the environment. To the extent possible, stored water needs to be accessible to purveyors and users at times of their choosing. The term "wet-period diversion system" is shorthand for this principle. The wettest periods also have special ecological value that should not be sacrificed. Nonetheless, California must take advantage of abundance when it exists, so that conflict between water needs and ecosystems can be reduced during dry periods.

Figure 1-12 shows diversions and use by region. Most of the water that historically flowed through the Delta and out the Bay is used in the watershed itself, with only relatively small amounts transferred across the Tehachapi Mountains. Meeting the needs of all regions will require improved conveyance, increased storage, and aggressive conservation and efficiency improvements.

Insert Figure 1-12 (now Figure 1-13) "Statewide upstream and export diversion from the Delta watershed."

Our Vision recommended that conveyance and storage facilities in the Delta watershed, in the Delta itself, and in its export areas need to be improved—and better linked. We conclude that the best option for Delta conveyance is probably a two-channel dual conveyance that

combines a single through-Delta channel, likely Middle River, with another channel designed for water conveyance. We have identified a dozen factors to be analyzed in reaching final decisions regarding improved conveyance and storage. These factors are listed in Volume 2, Strategy 5.1 and include analyses of water flows needed for the ecosystem, integration with storage, operational criteria, sea level rise and seismic and flood risks.[20]

The Task Force's recommended approach has multiple advantages over the current system:

- It expands overall water export capacity, allowing larger amounts of water to be moved across the Delta when it is least harmful to the ecosystem and the Delta itself.
- It expands management flexibility, so that water can be conveyed in a variety of ways, depending upon the needs of the ecosystem and the Delta region.
- It reduces pumping risks to fish in the south Delta
- It encourages some drinking water supplies to be moved from the current dead-end located in the south Delta, where quality is low, to free-flowing river channels where quality is higher.

But improved conveyance through the Delta serves little purpose if there are not sufficient reservoirs or underground water banks both north and south of the Delta to store the water. Though there is currently more storage in southern California than can be filled, over the long-term increased demand and climate change will put storage at a premium.

Despite the Task Force's call for the immediate completion of CALFED's surface storage investigations and speedy implementation of any options that optimize the capture of wet-period flows, groundwater storage remains a critical and preferable part of any successful storage system. Among the Task Force's recommendations are several specific actions to better integrate groundwater storage into water planning throughout the state, and make state funding for various water projects contingent on timely completion of such planning.

Goal 6: Reduce risks to people, property, and state interests in the Delta by effective emergency preparedness, appropriate land uses and strategic investments.

Strategy 6.1: Achieve levels of emergency protection consistent with federal and state policies.

Strategy 6.2: Discourage inappropriate land uses in the Delta region.

Strategy 6.3: Prepare a comprehensive long-term levee investment strategy that matches the level of protection provided by Delta levees and the uses of land and water enabled by those levees.

Scientists conclude that the Delta faces enormous risks of levee failure—as high as a two-in-three chance of multiple levee failures in the next 30 years, according to the U.S. Geological Survey. Even without a catastrophe, levee maintenance and strengthening against sea level rise and subsidence requires better policies and continued investment. The projected expense of fully fortifying all Delta levees against sea level rise and potential disasters is very substantial.

[20] . Delta Vision Blue Ribbon Task Force letter to Governor Arnold Schwarzenegger, June 30, 2008.

The State must reduce risks to life and property—and its own potential liabilities for levee failures—in an equitable and economically rational manner. The state cannot and should not attempt to create an unsustainable "fortress Delta."

Our chief strategy is to match levee design to land use throughout the Delta. There are two sides to the risk equation—the quality of levees, and the value of the property they protect. The more intensive the land use in a particular place, the stronger the levees should be. However, this principle should not be mistaken as encouragement for intensive urban development in order to finance levee costs within the Delta.

Where levees are inadequate, intensive land uses such as housing should not occur. Land use decisions in the Delta are a matter of public safety. Even if new developments in flood-prone areas were to build their own levees, there would still be a considerable residual risk of flooding. Just as importantly, any new levees constructed to protect new developments in floodplains could actually increase failure risks for existing levees nearby. Over time, as levees are selectively strengthened and wise land use choices are made, risk will be reduced—a benefit to the Delta and the state as a whole. A rational state policy on Delta levees and urban development is essential, because the state is now potentially exposed to near-complete financial responsibility for any levee failure.

This strategic plan recommends limited, but important, changes in local government land use powers. Within the primary zone, the Delta Protection Commission is given direct permitting authority over land use. This is intended to integrate decision making in this critical area where land uses are already heavily limited by the Delta Protection Act. The shift recognizes that the state's interests in the primary zone, already large as evidenced by policies focused on water and the ecosystem, current land ownership, and funds for levees, will continue to grow. This recommendation creates a single arena for addressing both state and local government interests in land uses in the primary zone of the Delta.

In addition, selected areas of the secondary zone would be subject to increased land use oversight. The floodplains of the San Joaquin and Mokelumne Rivers, along with Bethel Island and the northern portion of Brannan-Andrus Island, pose special land use challenges that merit additional oversight. Local governments should be required to create local plans for these areas that ensure that land uses will be in conformity with the state's California Delta Ecosystem and Water Plan (see strategy 7.2).

A number of Delta levees help protect the Delta from major saltwater intrusion and they shape the flows of fresh water through the region. The value of these levees for water supply reliability and ecosystem management must be recognized. When setting levee policy, it is essential to look some decades in the future to protect levees that are critical to important state interests.

There is an additional way to reduce risks in the Delta – by ensuring that its inhabitants are prepared for emergencies. Emergency preparedness exercises, planning, and other emergency management actions should commence immediately. If a major disaster were to strike the Delta without proper emergency drills, evacuation planning, and pre-positioning of materials, California must shoulder the blame for the resulting loss of life and economic damage. Although emergency preparedness attracts little attention or enthusiasm among citizens, it is critical to saving lives, protecting property and reducing costs after disasters.

Goal 7: Establish a new governance structure with the authority, responsibility, accountability, science support and secure funding to achieve these goals.

Strategy 7.1: Create the California Delta Ecosystem and Water Council, create a new Delta Conservancy to implement ecosystem restoration projects and enhance the roles of the Delta Protection Commission. Close out the existing California Bay-Delta Authority and transfer needed CALFED programs to the new Council.

Strategy 7.2: Create a California Delta Ecosystem and Water Plan to ensure flexibility and consistency of action among state, federal, and local entities.

Strategy 7.3: Finance the activities called for in the new Delta Ecosystem and Water Management Plan from multiple sources.

There is now no effective way to accomplish any of the recommendations made in last November's Vision for the Delta, or this Strategic Plan, without a more effective governance structure.

No existing state, federal or local governmental entity has the legal authority, nor the competencies and resources needed, to implement the recommendations made here. Yet the legal authority to act, and the development of needed expertise, are the foundations upon which policy making for water and the Delta ecosystem must be based. [21]

Some individual actions recommended here CAN be implemented by existing agencies, though in most instances additional authority and resources would accelerate success. Strategies to improve efficiency of water use are an example.

However, successful construction of an improved Delta water conveyance system will not solve forever all the water problems of California. Consider these points:

- Growth in population will create ever greater demand for water already over subscribed.
- The list of species being protected by state and federal endangered species acts will increase and some species are likely to become extinct.
- Lacking accurate information on water diversion and uses or on the functioning of ecosystems, policy makers will find it difficult to anticipate either coming crises or responses to their proposed actions.
- Without governance capacity to integrate actions in multiple arenas, policy initiatives will not mesh well and are likely to often be at cross purposes.
- Private investment in business, agriculture and housing will be increasingly affected by less reliable water supplies and increased risk.

Figure 1-13, showing the various Delta policy efforts now underway, is a graphic representation of the current fragmentation of authority. Success in achieving the goals of Delta Vision requires far more sustained and coherent action than is possible with current institutions.

[21] . ABx2 8, a pending water bond bill, proposes expanding powers of the inactive California Water Commission to allocate money among proposed water storage projects on public benefit criteria. Under current authority, the Commission is advisory to the Director of the Department of Water Resources on water policies. The proposed modifications would leave the Commission inadequate to implement recommendations made in this strategic plan.

Insert Figure 1-13, the "Dorian"

Beyond the fragmentation of governance, it is distressing that thirty-five years after passage of the Federal Endangered Species Act and twenty-four years after passage of the California Endangered Species Act, California has yet to incorporate these species protection laws into water policy making adequately.

Most Californians receive water supplies from systems designed and primarily constructed before passage of modern species protection laws. The legal challenges to biological opinions for smelt and salmon before Judge Wanger, in particular, have unambiguously signaled that water delivery systems must now comply with species protection laws. Moreover, the remedies imposed by Judge Wanger also signal that water needed by endangered species will be provided as a first obligation.

In a separate decision on the legality of the Programmatic Environmental Impact Statement/Report of the CALFED Bay-Delta Record of Decision under CEQA, the California Supreme Court also commented on the interplay of water exports and endangered species laws. The Court strongly—and unanimously—stated:

> *"...Bay-Delta ecosystem restoration to protect endangered species is mandated by both state and federal endangered species laws, and for this reason water exports from the Bay-Delta ultimately must be subordinated to environmental considerations. The CALFED Program is premised on the theory, as yet unproven, that it is possible to restore the Bay-Delta's ecological health while maintaining and perhaps increasing Bay-Delta water exports through the CVP [Central Valley Project] and SWP [State Water Project]. If practical experience demonstrates that the theory is unsound, Bay-Delta water exports may need to be capped or reduced."*[22]

Crises of ecosystem deterioration lead to court-ordered interruption of water deliveries. There are physical solutions for these problems, such as alternative conveyance, but the only way to make, implement and refine these solutions is through effective governance. The need for strengthened governance lies at the heart of the Delta's challenges. The quality and flexibility of governance is a pivotal concern that stretches across every aspect of Delta management. Both improved "carrots" and more effective "sticks" are needed for effective governance. Capacity to make decisions, especially to improve the reliability of water supply, is a large incentive for water users. Authority to enforce ecosystem requirements is the way to achieve a more reliable water system in the state.

Any new governance structure must be capable of making and implementing effective policies in a world of competing stakeholders, climate change, new invasive species and the potential of catastrophic levee failures. The governance structure, advised by evolving scientific understanding of the Delta, must be capable of learning and adapting in difficult circumstances of high risk and high importance to society.

The core ideas recommended here—a Council achieving its work primarily through a Delta plan which guides the actions of government agencies, a conservancy to implement ecosystem restoration projects, and an enhanced role for the Delta Protection Commission—emerged from the impressive effort of a Delta Vision stakeholder work group. That work group found the status quo unacceptable and could identify no existing state

22. Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings (2008) 43 Cal.4th 1143, 1168.

agency with the authority or competencies required to achieve the recommendations of Delta Vision.[23]

Only one alternative proposal regarding governance was received, from a coalition of water and business interests, supporting creation of a council but in an oversight mode and requiring existing agencies to pursue the objectives recommended in the Delta Vision Strategic Plan. The Council would monitor performance and direct attention to areas of needed improvement. If this was not sufficient, the powers of the Council could be increased over time.[24] This group gives primacy to physical improvements in conveyance, ecosystem improvements, increased storage and strategic levees, all recommended here. They also allege more success from previous voluntary initiatives than seems warranted, given the continued ecosystem crises, declining reliability of water supplies and the inadequacies in many voluntary approaches revealed in failure to achieve anticipated goals and legal challenges.

The governance structure recommended here, shown in Figure 1-14, focuses on the minimum actions required to address the issue given to the Task Force by Governor Schwarzenegger, including crucial elements of accountability, transparency and financing. That structure would include:

- A California Delta Ecosystem and Water Council charged with the mission of achieving the co-equal goal and the other goals of this strategic plan. The existing California Bay-Delta Authority would cease to exist, with any remaining duties transferred to the Council.

  The Council should consist of five to seven voting members, including a chair, all nominated by the Governor and confirmed by the State Senate. No geographic, occupational or representational criteria are proposed for these appointments. The criteria used for appointment of the Delta Vision Blue Ribbon Task Force are appropriate: “members…to include diverse expertise and perspectives, policy and resource experts, strategic problem solvers, and individuals having successfully resolved multi-interest conflicts.” The members and a chair should be appointed to five-year staggered terms.

  The Council’s primary responsibilities and authorities would be to develop, adopt and guide implementation of a plan governing activity in the Delta, incorporating elements of relevant plans from other agencies where appropriate. The Council would have the authority to determine if other agencies are in compliance with the Delta Plan.

- A new body, the California Delta Conservancy, to coordinate Delta ecosystem restoration.

  The Conservancy would be responsible for implementation and coordination of Delta ecosystem enhancement and related revitalization projects. The Conservancy’s jurisdiction should cover the Delta and the Suisun Marsh and it would have responsibility for working with public agencies, local, state and federal, land owners, and non profits in achieving its mission.

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[23]. The work group final work product, presented at the May 2008 Task Force meetings is at: http://www.deltavision.ca.gov/BlueRibbonTaskForce/May2008/Handouts/Item_13.pdf.

[24] See comment letters from business and water agency stakeholders dated August 1, 2008, September 2, 2008 and September 30, 2008 on the Delta Vision website. http://www.deltavision.ca.gov/StrategicPlanningDocumentsandComments.shtml

The Conservancy should be governed by 11 voting members, including both local and state officials serving staggered terms, with selected federal participation in non-voting roles. Five members would represent the five Delta counties, selected by the Governor from nominees advanced by the Delta Protection Commission; four members would represent state interests, including the Secretary for Resources, the Director of the Department of Finance, and two pubic members with business or land trust experience, appointed by the Governor; and two public members, one each appointed by the President Pro Tem of the California Senate and the Speaker of the California Assembly. The Governor should appoint the chair of the Conservancy.

- An expansion of authority for the existing Delta Protection Commission, including responsibility for management of the proposed National Heritage Area designation for the Delta.

The Delta Protection Commission was created in 1992 and given appellate review of proposed land uses in the Delta primary zone. Its membership should be expanded to include representation of the Central Valley Flood Board. Federal agencies, including the U. S. Army Corps of Engineers, the U. S. Fish and Wildlife Service and the U. S. Bureau of Reclamation should be invited to participate as needed. The Commission would be given additional roles to facilitate achieving regional policies enhancing the value of the Delta as a place. The Commission would have responsibility to work with local governments to ensure consistency of their plans in the secondary zone with the Delta Plan. It would also have direct permitting authority for projects within the Delta's primary zone.

Insert Figure 1-14, "Potential Governance Structure"

Local government decisions and actions are important in the Delta. Counties and cities make land use decisions, provide many critical services, and encourage economic development, among other roles. Reclamation districts maintain levees and other special districts provide services such as water supply or mosquito control. Success in implementation of the policies of the Council expressed through the Delta Plan will rely heavily on local government actions.

Existing state agencies would retain their existing authorities but have statutory responsibility to implement the adopted Delta Plan. The Department of Water Resources, California Department of Fish and Game, State Water Resources Control Board, State Lands Commission and other state agencies will be critical participants in developing the Delta Plan, which will build upon and incorporate their relevant planning and policy making. In developing and adopting the Delta Plan, the Council will make decisions required to achieve integrated action focused on the co-equal goal and other policies of the Council.

Existing agencies have a critical role in achieving the Delta Plan:

- For the science and regulatory implementation of species protection laws: the California Department of Fish and Game and the United States Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service

- For linkage of ecosystem policies and programs focused on the Delta with the larger Delta watershed: the Department of Fish and Game, in cooperation with the United States Fish and Wildlife Service and the National Marine Fisheries Service through the

CALFED Ecosystem Restoration Program and successor programs established by the recommended Council

- For construction and ownership of water conveyance and storage facilities: the California Department of Water Resources and the United States Bureau of Reclamation.
- For application of water rights and water quality laws: the State Water Resources Control Board and regional water quality boards.
- For land use and resource management policies under the Delta Protection Act: the Delta Protection Commission and the State Lands Commission.
- For local government functions, including police powers and service provision, which contribute to the value of the Delta as place: Existing local governments.

While the authorities of existing agencies will remain largely unchanged, increased resources are needed to implement these recommendations. This is especially true for the Department of Fish and Game and the State Water Resources Control Board, which need additional resources to discharge their responsibilities effectively.

It is clear that the capacity of the Department of Water Resources for effective planning and managing of statewide water resources should be significantly enhanced. It is likely that responsibility for operations and maintenance of the State Water Project should be shifted to a new public entity, although the details of that shift remain to be developed. DWR's responsibilities for water policy, flood control, project design, permitting and implementation and for grant administration should be enhanced. It should also retain responsibility for design, construction and ownership of facilities for the State Water Project.

All three of these state agencies, DFG, SWRCB and DWR need sufficient and stable revenues which are not dependent on general fund allocations or bonds in order to discharge their responsibilities effectively and responsibly.

Successful governance of the Delta will depend on a coherent, effective and reliable financing structure. That system will include financing to pay capital costs, whether by General Obligation or Revenue Bonds and authority to impose fees reasonably related to the implementation of the Delta Plan

Financing will require a flexible approach. There is currently no reliable estimate of benefits, costs, obligations, and risks of the projects being discussed in this Strategic Plan. However, current analyses suggest that capital requirements for conveyance improvements, ecosystem projects and levee improvements in the next 10 to 15 years will total from $12 billion to $24 billion. High estimates approach $80 billion. Refined estimates of capital and operations costs must be developed as projects become more specific. Commitments to transparency, cost effectiveness and incentives for efficiency will expedite financing processes in the face of uncertainty. The use of federal funding must be maximized as should all currently available bond funding.

Learn While Acting

Our Vision emphasized that the Delta's challenges are characterized not only by their complexity, but also by their uncertainty. But as the Vision says, "far from being a prescription for paralysis … recognizing both uncertainty in knowledge and uncertainty about outcomes of policies and programs has very specific implications for future Delta management."

One of those implications is that adaptive management must be at the center of Delta governance and decision-making. Indeed, addressing uncertainty effectively requires improved governance and decision making.

Uncertainty in the Delta ecosystem and in policy making

There are two kinds of uncertainty in the Delta ecosystem. One is lack of full understanding of how the system works. Drawing cause-and-effect conclusions about the ecological changes occurring in the Delta is surprisingly difficult. There are multiple variables that interact in complex ways, making it hard to establish precisely what the effects of a given management action will be on a specific resource.

The second form of uncertainty is that the Delta ecosystem will continue to change in ways that cannot be predicted. Even if the ecosystem was understood perfectly now, its future behavior still cannot be predicted with certainty. In addition, outside forces, such as climate change or earthquakes, will eventually change important underlying factors that shape the system's overall behavior.

Equally important is the uncertainty about the effectiveness of policy tools. An attractive approach may prove impossible to implement. The best idea may prove less effective than anticipated, or even counter productive. New technologies create opportunities for new policy tools. For these reasons, continuing systematic assessment of the performance of policies is critical. This approach to resources planning can best be described as "adaptive management".

Defining adaptive management

Adaptive management is defined by the federal government as follows:

> *"A type of natural resource management in which decisions are made as part of an ongoing science-based process. Adaptive management involves testing, monitoring, and evaluating applied strategies, and incorporating new knowledge into management approaches that are based on scientific findings and the needs of society. Results are used to modify management policy, strategies, and practices."*[25]

Adaptive management is not a series of after-the-fact reactions to changes in ecosystem performance. Rather, adaptive management requires decision-making, which recognizes the probability of less-than-desired results and makes decisions based on the best available science using the best available policy tools. Adaptive management equally commits to observing, analyzing and understanding the results of those prior actions. Finally, adaptive

25. Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management, 65 Fed.Reg. 62566. 62571 (Oct. 18, 2000).

management requires the political, managerial and operational capacity to design and implement improved actions.

This cycle is repeated, incorporating over time, changes in the underlying systems, advances in scientific understanding, new policy tools, and changing policy decisions. To gain the advantages of local knowledge and increased stakeholder commitment to not only particular decisions, but also to the iterative character of adaptive management, considerable attention must be given to effectively incorporating stakeholders over long periods of time. As authority for making and/or implementing relevant policies is often fragmented among several state, federal and local agencies, similar attention must be given to effectively linking multiple agencies over long periods of time.

The California Delta Ecosystem and Water Plan recommended in Strategy 7.2 has the advantages of integrating the actions of many relevant agencies and also of being regularly revised on five-year cycles. These regular reviews and updates also provide a schedule of review activities involving stakeholder participation. This rhythm of review cycles requires organizing scientific understanding and program assessment to a point where they can inform policy making.

Reporting Progress

Assessing, evaluating, and reporting progress toward achieving the Delta Vision is critical to successful adoption, funding, and implementation of this Strategic Plan. An effective and transparent method of evaluating progress towards meeting clear goals provides accountability, which motivates decision-makers to continually assess strategy effectiveness and take corrective action if needed. Clearly communicating how well the Delta is doing also informs the public about how well the Strategic Plan is working, promoting trust.

Establishing indicators, assigning performance measures and targets, and measuring and monitoring their status is a common method used to evaluate effectiveness and whether goals are being met. Indicators are a set of conditions that help us understand how the system is working. Performance measures increase plan efficiency by providing defined expectations—targets—in key areas where success will be judged.

Continued monitoring and assessment of key indicators and performance measures enables strategies to be tested and refined. These practices also indicate where resources are being used smartly or if resource reallocation is necessary.

Progress reports provide both transparency and an indication of how effective the strategies are. Report cards are effective tools for highlighting assessment results and communicating scientific understanding to policy makers and to the general public. They have been used successfully in other complex planning arenas, such as the restoration of Chesapeake Bay.

To evaluate and report progress, a summary-level indicator was identified for each Strategic Plan goal. The collective performance of all indicators serves to evaluate the Task Force's primary goal. Sub-indicators were selected when necessary to capture different aspects of performance.

Goal	Indicator
Goal 1: Legally acknowledge the co-equal status of restoring the Delta ecosystem and creating a more reliable water supply for California.	(Success is evaluated by the collective performance of the indicators below.)

Goal	Indicator
Goal 2: Recognize and enhance unique cultural, recreational, and agricultural values of the Delta as an evolving place, an action critical to achieving our co-equal goal.	Delta Recognition and Value
Goal 3: Restore the Delta as the heart of a healthy estuary.	Estuary Health
Goal 4: Promote water conservation, efficiency, and sustainable use.	Water Sustainability
Goal 5: Build facilities to improve the existing water conveyance system and expand statewide storage, and operate both to achieve the co-equal goal.	Water Supply Reliability
Goal 6: Reduce risks to people, property, and state interests in the Delta by effective emergency preparedness, appropriate land uses and strategic investments.	Delta Risk
Goal 7: Establish a new governance structure with the authority, responsibility, accountability, science support and secure funding to achieve these goals.	Government Effectiveness

Each indicator is comprised of several "reporting level" performance measures, each of which, in turn, has an associated target and timeline. Each performance measure will be monitored and evaluated regularly by an independent assessment team. Progress toward meeting each performance target will be expressed by the team as a percentage of target attained. To report the status of achieving the Delta Vision, progress towards meeting performance targets will be combined into one score or grade for each indicator, or sub-indicator, where applicable. Similar to the integration and linkage of all 12 Vision recommendations, success toward realizing the Vision cannot be claimed unless all indicators are performing well.

These indicators and their components will be tracked, along with the status of strategy implementation, and reported to policy makers and the public through a Delta Vision Report Card, which will be issued by an independent and objective board on a regular basis. The Report Card will indicate if implemented strategies are working, or it may signal to policy makers that a course adjustment is necessary.

Appendix 1 shows which performance measures are proposed for each indicator. These are interim measures, to be refined by the Delta Science and Engineering Board and the Council before July 2009.

Near Term Actions

As in the Vision, near term actions are also needed and recommended. These are critical steps which warrant initiating as soon as possible. They either are needed to foster more effective policy making or address immediate threats to Delta inhabitants or its ecosystem, or to water conveyance systems. All these actions are recommended; no ranking of priority is suggested.

1. Obtain needed information on water diversion and use

It is impossible to make effective water policy for the state or to 'plan for drought' if so much water use in the state is unreported. The Legislature should enact, and the State Water Resources Control Board should enforce, a law requiring universal, consistent reporting on water diversion and use for all water agencies and other substantial diverters.

This act should repeal all current exemptions to reporting, plus include reports on ground water and pre-1914 and riparian users. The legislation should require reporting for water use for the years 2006 through 2009. That would become the presumptive level of water use for public policy decisions until a better system is established. Water users who did not meter water in this period may develop estimates of water use from utility bills, crop production records, or other means approved by the State Water Resources Control Board or the Department of Water Resources. The reports for 2006 to 2008 should be provided by March 1, 2009 and are due annually for the immediate past year thereafter.

2. Initiate collection of improved data about the Delta to inform policy processes and project level decision making by all public agencies, local, state and federal. Included are socio economic data, locations of physical structures, and ecosystem function data.

Improved data will provide a better basis for policy making, which will be increasingly critical as decisions move from broad planning to specific projects in the Delta. Among the data to be collected, high priority should be given to socio economic data. Assembling and assessing available data and analyses should be the first step, to be completed by April 2009. A plan for collection of additional needed data and analyses should be completed by June 2009 and recommended data collection and analyses initiated no later than July 2009.

3. Accelerate completion of in-stream flow analyses for the Delta watershed by the Department of Fish and Game.

Use bond or other funding to complete these in-stream flow analyses by 2015. They are the foundation for Delta-related decision making by the State Water Resources Control Board.

4. Conduct a Middle River Corridor Two Barrier pilot project.

This pilot project involves testing two temporary barriers at two locations (Old River and Connection Slough) to partially isolate Middle River and Old River near Franks Tract. The temporary barriers would be tested together with preventive flow control actions and possibly modified Delta Cross Channel operations to maintain positive San Joaquin River outflow and reduce smelt and salmon migration toward the export pumps. Some believe that this project has the potential to provide immediate benefits and will also

provide data needed to evaluate dual conveyance as a potential long-term Delta conveyance solution.

5. Construct an alternative intake for the Contra Costa Water District.

As the Middle River corridor project is undertaken, it will also be desirable to construct an alternative intake for the Contra Costa Water District. Its current Old River intake could come into conflict with ecosystem restoration efforts if Old River is managed primarily for fish habitat. Constructing an alternative CCWD intake in Middle River would avoid any such conflict and also provide better quality water for CCWD customers.

6. Evaluate the effectiveness of a Three Mile Slough Barrier project.

This project involves constructing an operable barrier across Three Mile Slough between Sherman Island and Brannan-Andrus Island. This project could potentially provide protection for delta smelt, reduce Delta salinity intrusion in the fall, and reduce the water supply impacts resulting from recent federal court decisions. The pace of the Department of Water Resources' Environmental Impact Report/Statement on alternative barrier configurations should be accelerated, so that DWR may conduct a pilot study to evaluate the effectiveness of the selected Three Mile Slough barrier within two years.

7. Construct a demonstration fish protection screen at Clifton Court Forebay.

Recent bond measures have made funds available for constructing a demonstration fish screen at Clifton Court Forebay to protect delta smelt, salmon and steelhead in the vicinity of the pumps. A pilot study of these fish screens should monitor data on the screen's effectiveness in reducing fish kills in the pumps and predation losses.

8. Conduct near-term ecosystem restoration opportunities.

Four ecosystem restoration opportunities in the Delta can be conducted in the immediate future. Each could have benefits for threatened fish species, and will offer an opportunity to gain experience that can be applied to the larger scale restoration projects needed in the future. Those four opportunities are:

- Tidal marsh restoration in Dutch Slough
- Tidal marsh restoration on Decker Island
- Tidal marsh restoration in two locations in Suisun Marsh (Meins Island and Van Sickle Island)
- Improved floodplain in the Yolo Bypass

9. Stockpile rock and other emergency response materials.

In the event of a disaster in the Delta, it is imperative that emergency response materials be pre-positioned so that they can be brought to bear as quickly as possible. Failure to do so could lead to a prolonged outage of the state and federal water projects, increased risk to Delta residents and greater disruption to infrastructure. Rock and other materials should be stockpiled at Rio Vista, Hood, the Port of Stockton and other appropriate locations. See Strategy 6.1 for additional near-term emergency preparation actions.

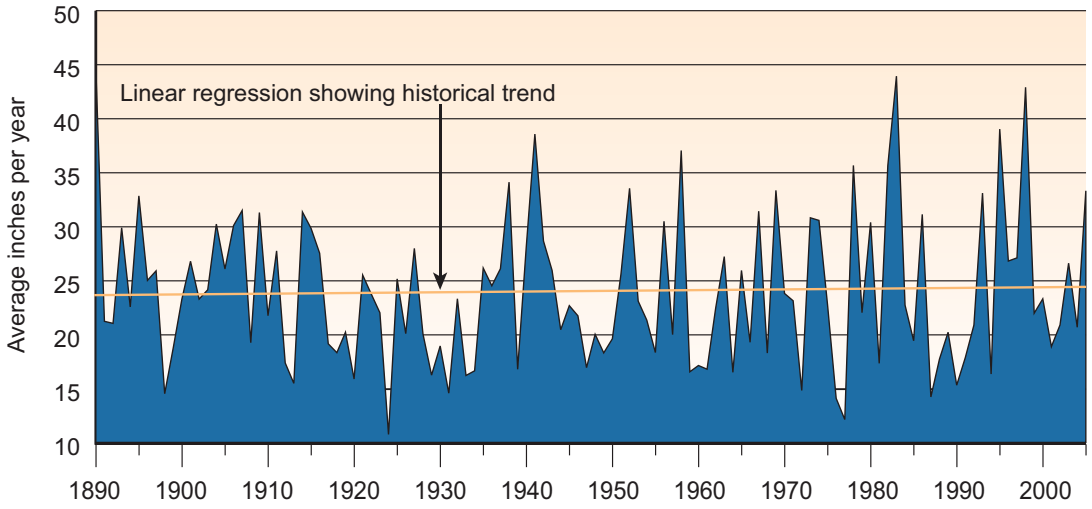
10. Assess and improve capacity of the State of California to respond to catastrophic events in the Delta.

Local governments and the Delta Protection Commission are developing emergency response plans. The state needs to assess and improve its capacity to respond to catastrophic events. That assessment and capacity improvement must go beyond water supply issues to human life, infrastructure and other property and resources in the Delta. The assessment should be led by the Office of Emergency Services and include at least the Business, Transportation and Housing Agency, the Department of Fish and Game and the Department of Water Resources. It should be completed by June 2010 and presented to the governor, Delta local governments and the Delta Protection Commission.

Figure 1-1: The 12 Linked Delta Vision Recommendations

1. The Delta ecosystem and a reliable water supply for California are the primary, co-equal goals for sustainable management of the Delta.
2. The California Delta is a unique and valued area, warranting recognition and special legal status from the State of California.
3. The Delta ecosystem must function as an integral part of a healthy estuary.
4. California's water supply is limited and must be managed with significantly higher efficiency to be adequate for its future population, growing economy, and vital environment.
5. The foundation for policymaking about California water resources must be the longstanding constitutional principles of "reasonable use" and "public trust;" these principles are particularly important and applicable to the Delta.
6. The goals of conservation, efficiency, and sustainable use must drive California water policies.
7. A revitalized Delta ecosystem will require reduced diversions—or changes in patterns and timing of those diversions upstream, within the Delta, and exported from the Delta—at critical times.
8. New facilities for conveyance and storage, and better linkage between the two, are needed to better manage California's water resources for both the estuary and exports.
9. Major investments in the California Delta and the statewide water management system must integrate and be consistent with specific policies in this vision. In particular, these strategic investments must strengthen selected levees, improve floodplain management, and improve water circulation and quality.
10. The current boundaries and governance system of the Delta must be changed. It is essential to have an independent body with authority to achieve the co-equal goals of ecosystem revitalization and adequate water supply for California—while also recognizing the importance of the Delta as a unique and valued area. This body must have secure funding and the ability to approve spending, planning, and water export levels.
11. Discouraging inappropriate urbanization of the Delta is critical both to preserve the Delta's unique character and to ensure adequate public safety.
12. Institutions and policies for the Delta should be designed for resiliency and adaptation.

Source: Delta Vision Report, 2007



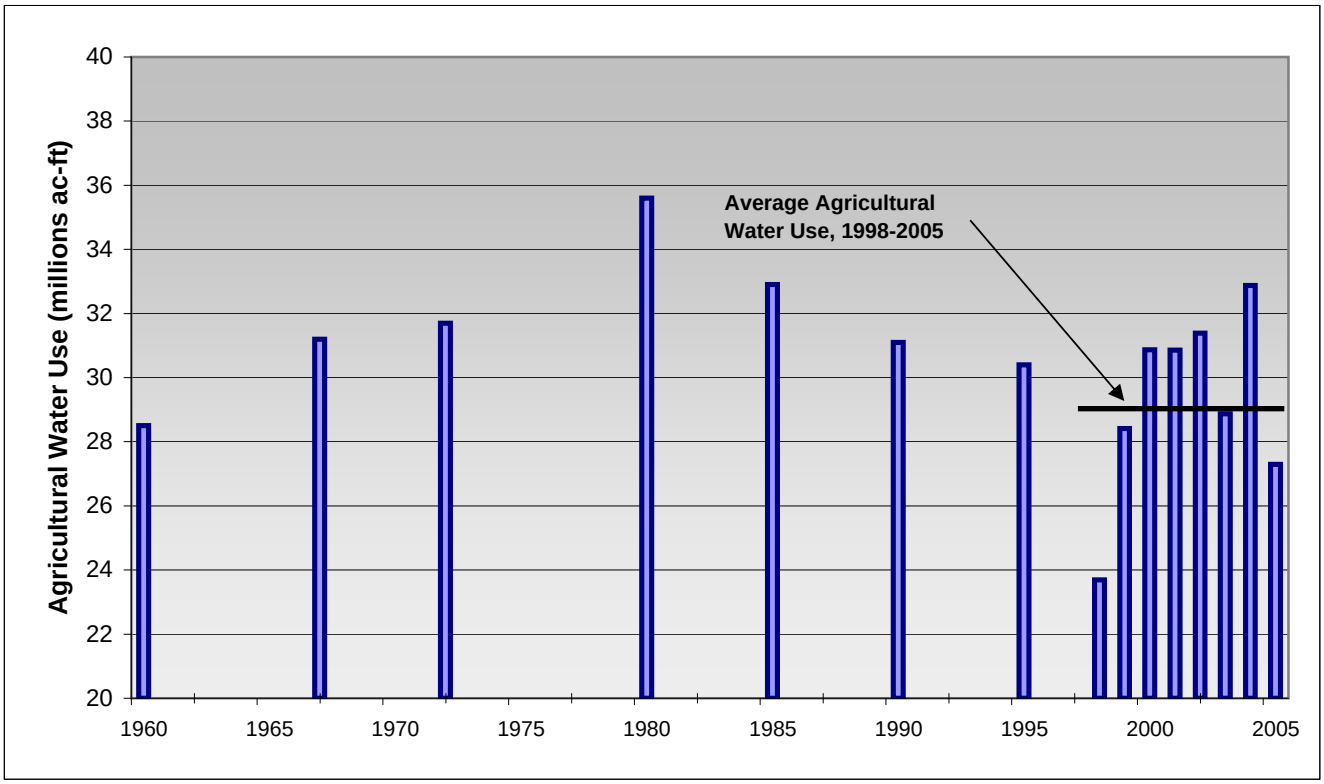
116 year average: 23.88 inches
Driest 30 years (1908-1937): 21.28 inches
Wettest 30 years (1977-2006): 24.88 inches

Figure 1-2: History of California Precipitation

Yearly precipitation calculated from average of 95 stations spread across California. Data collected by Jim Goodridge, state climatologist formerly with DWR.

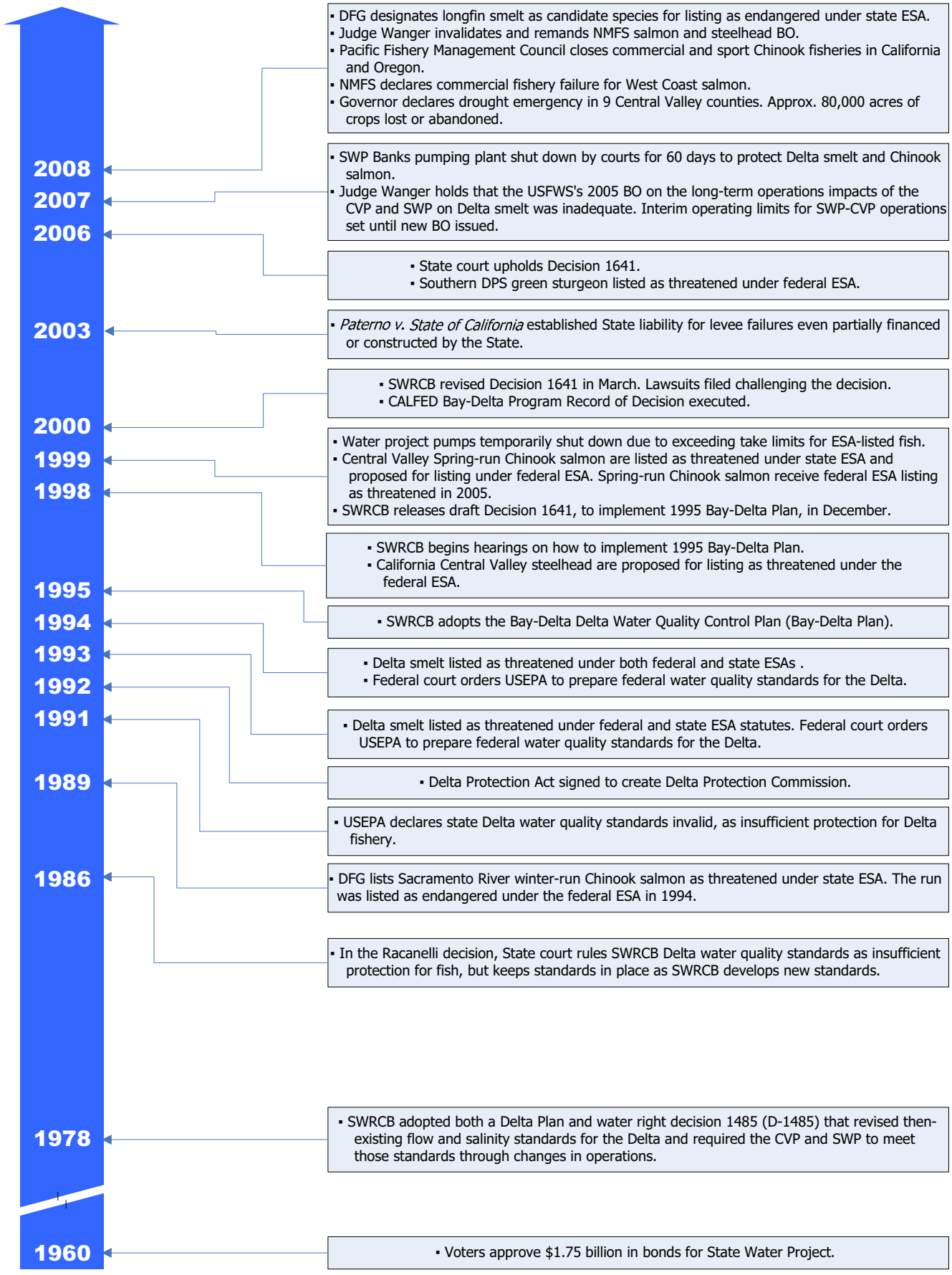
Source: California Department of Water Resources, 2006

Figure 1-3: Since 1998, Agricultural Water Use Trend is Inconclusive



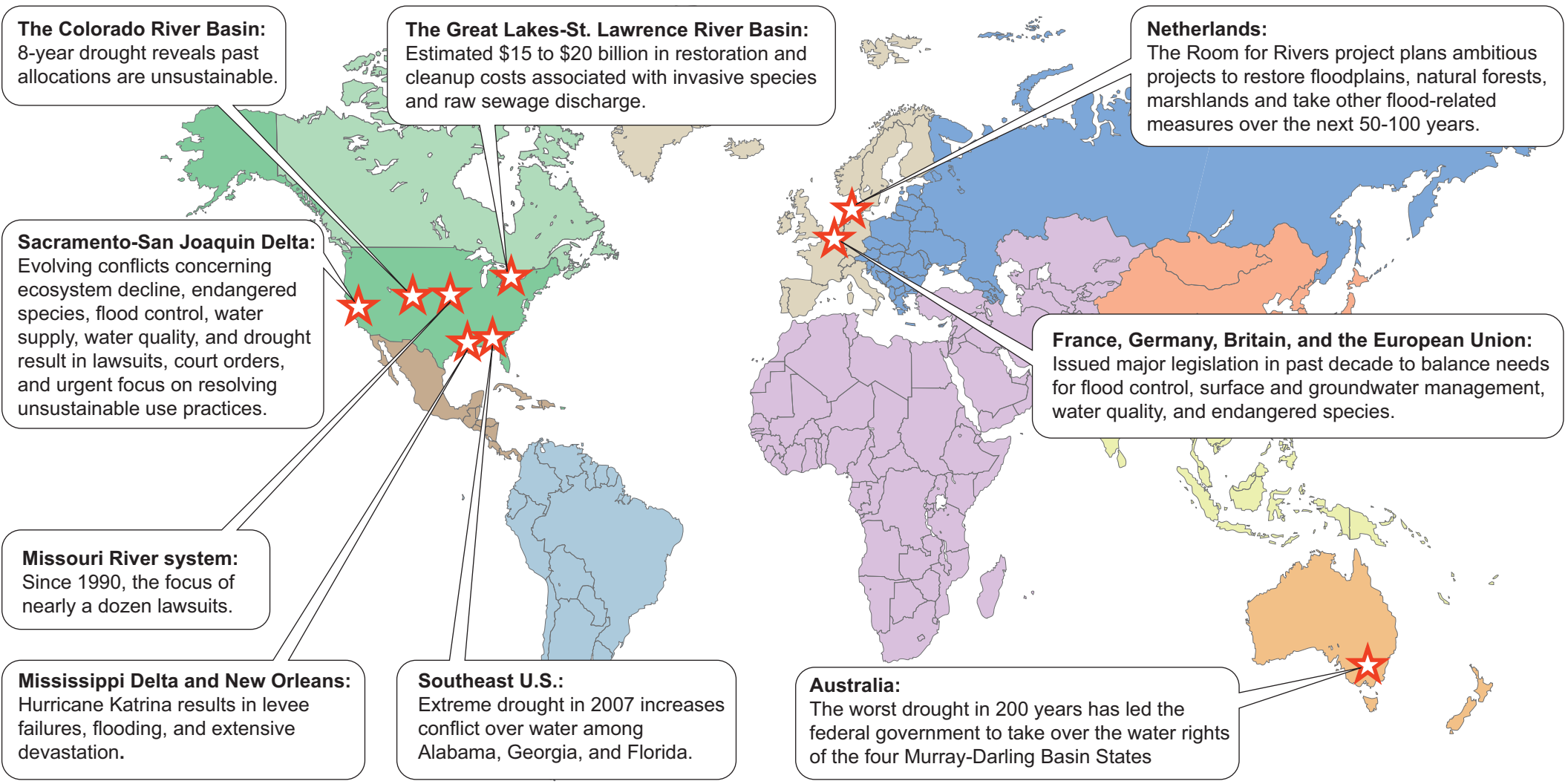
Source: CA Water Plan Series, 1960-1995. Data from 1998 through 2005 provided in draft Water Plan Update 2009.

Figure 1-4: Delta Conflicts and Uncertainty Reach Historic Intensity



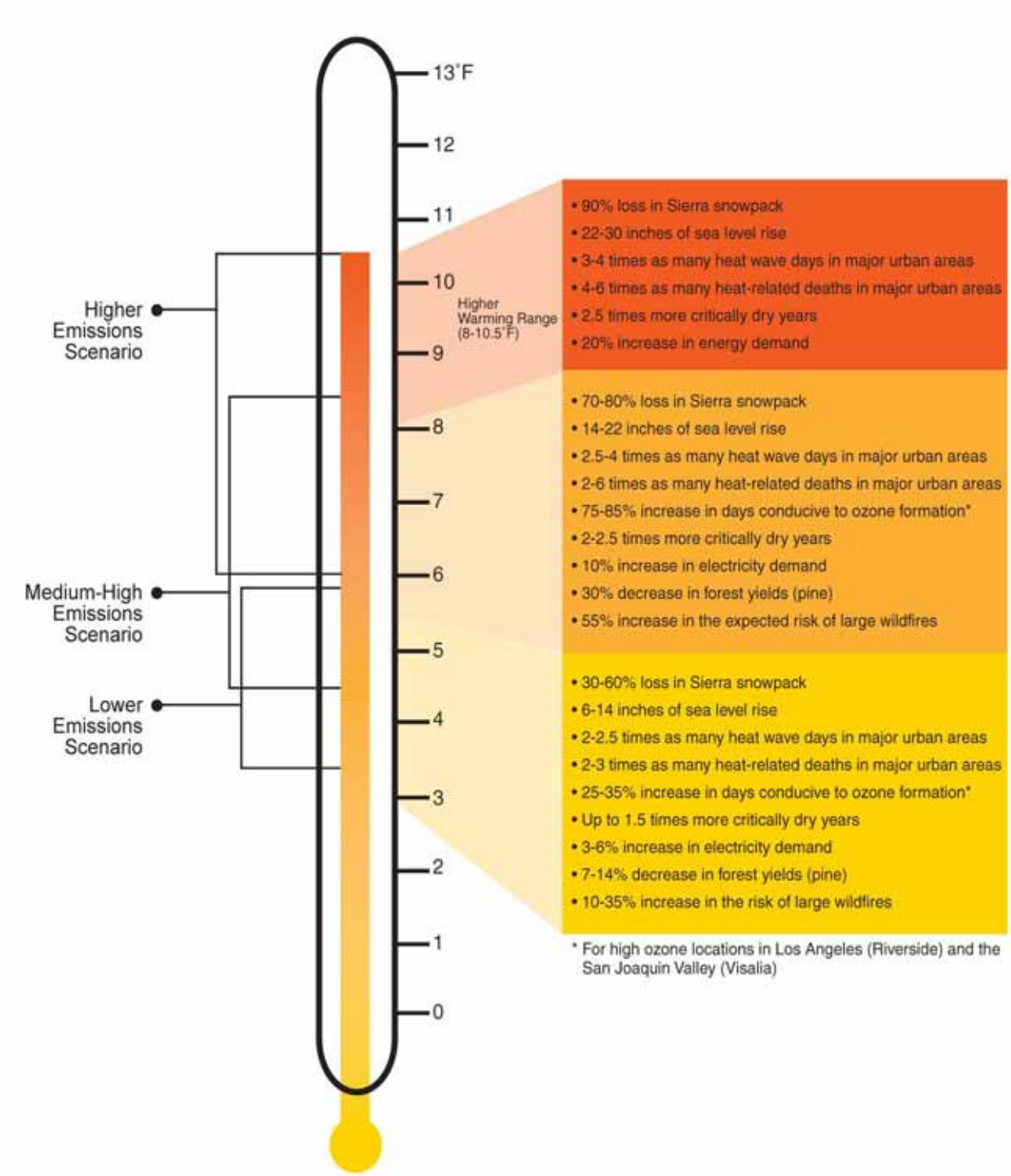
Source: Delta Vision Staff, 2008

Figure I-5
Global Water Crises



Source: Delta Vision Staff, 2008

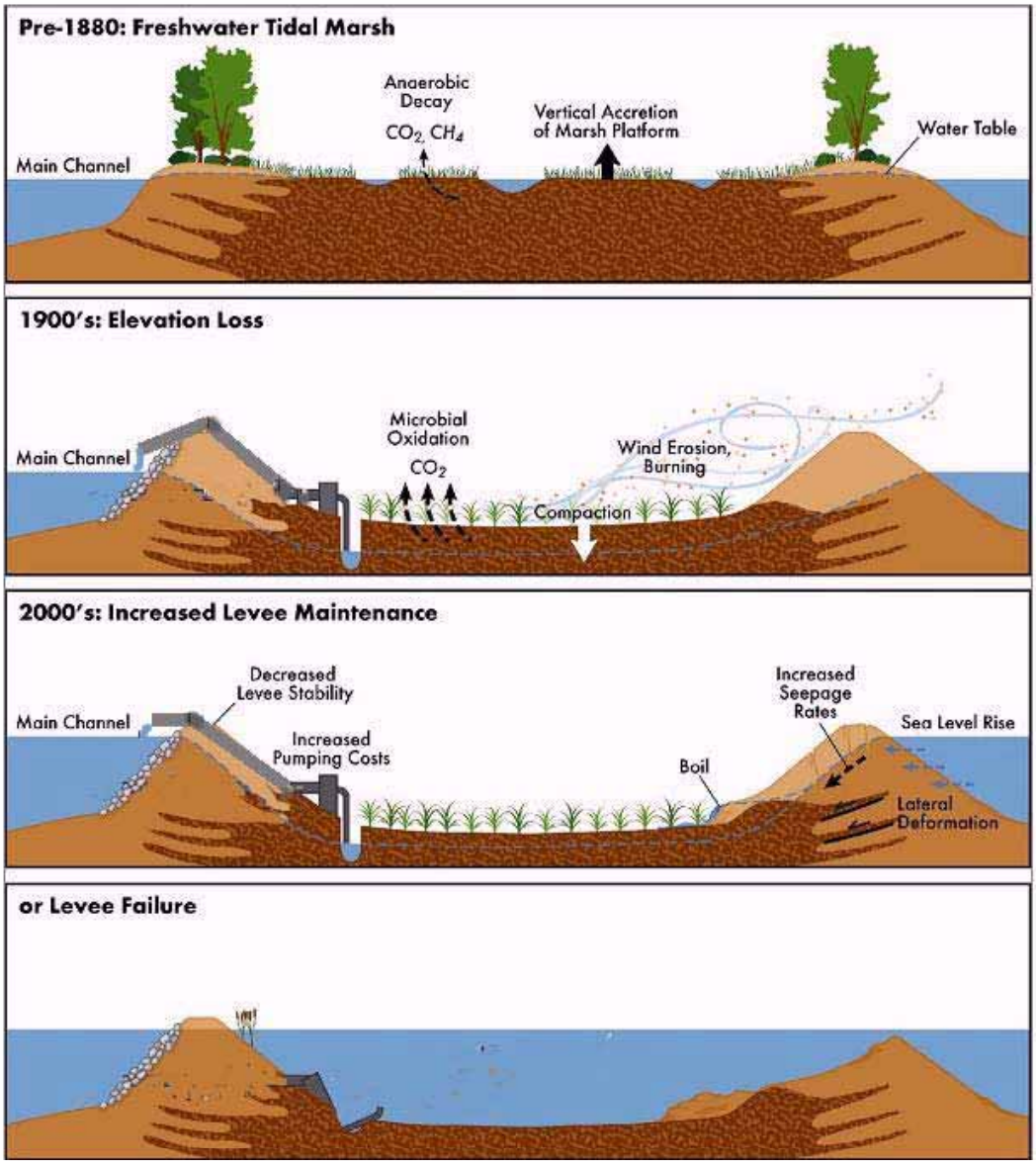
Figure 1-6
Summary of Projected Global Warming Impact, 2070-2099



Summary of Projected Global Warming Impact, 2070–2099 (as compared with 1961–1990) *Three climate change scenarios all show a trend for less winter snowpack (California Climate Change Center, 2006)*

Source: DWR, 2007. Status and Trends of Delta-Suisun Services. Produced for Delta Vision.

Figure 1-7
Effects of Growing Subsidence on Delta Levees



Source: Mount J., Twiss R. 2005. Subsidence, sea level rise, and seismicity in the Sacramento-San Joaquin Delta. San Francisco Estuary and Watershed Science. Vol. 3, Issue 1 (March 2005), Article 5.

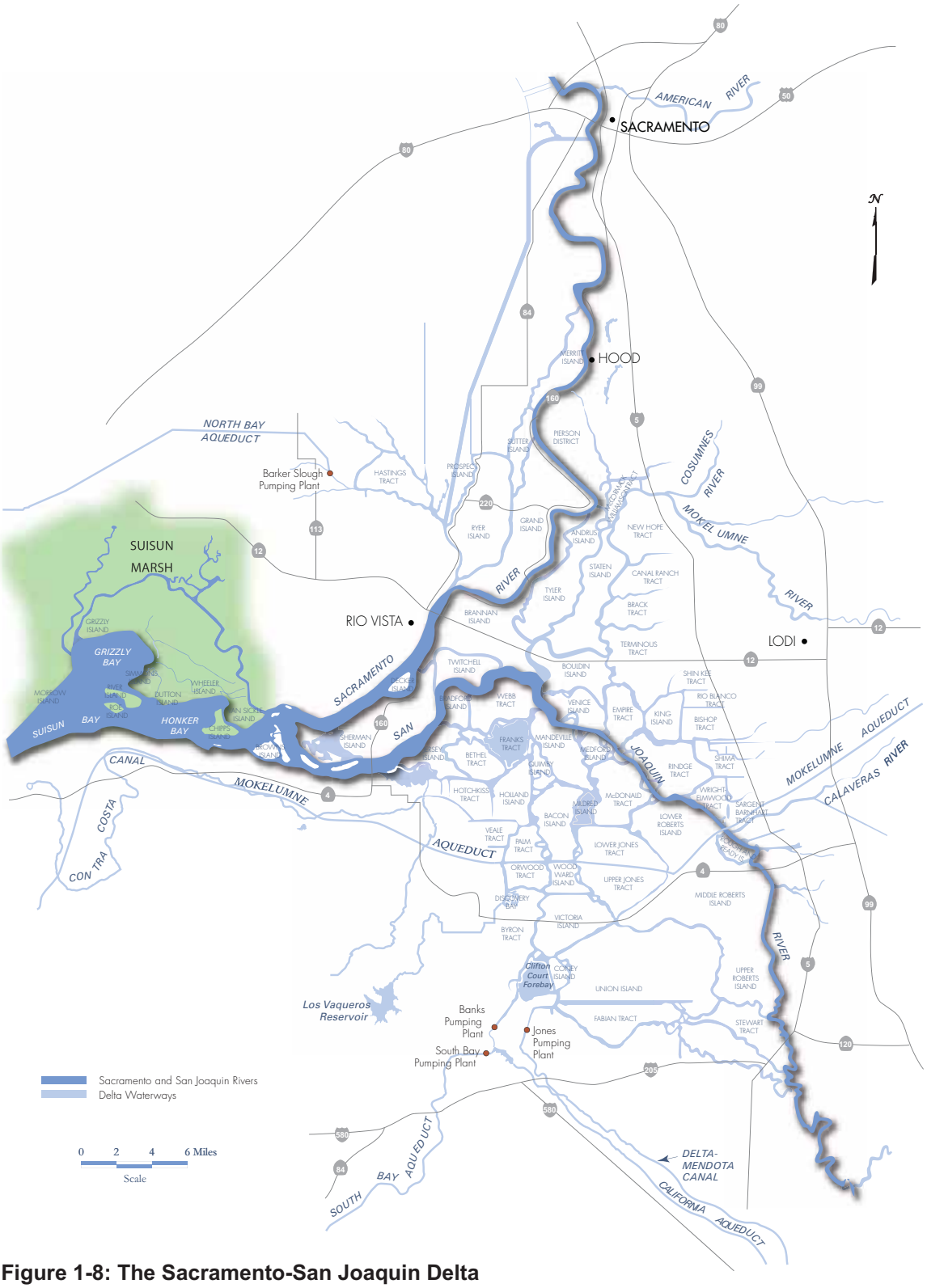
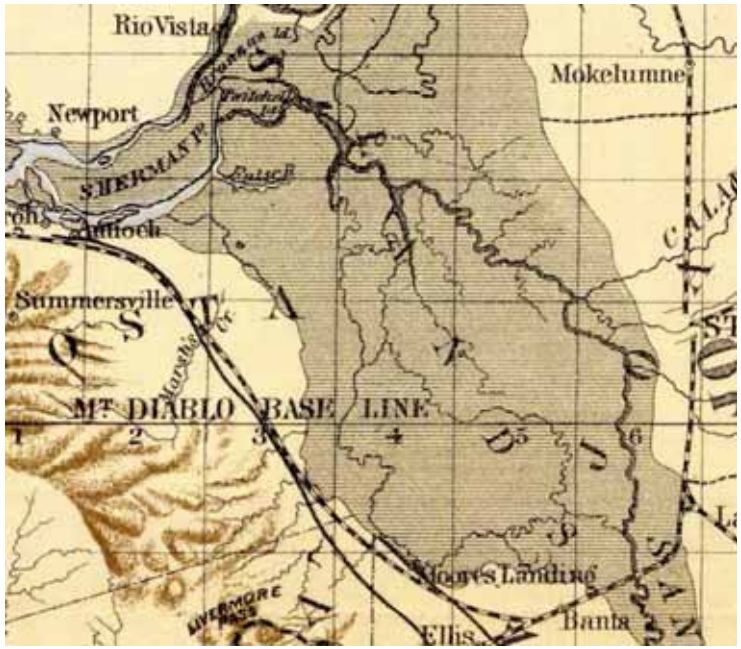
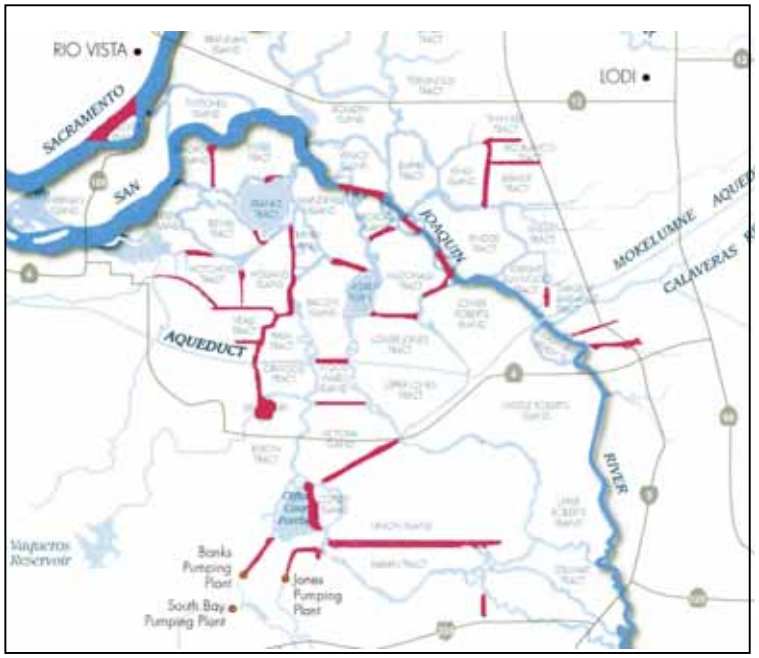


Figure 1-8: The Sacramento-San Joaquin Delta
Source: California Department of Water Resources

Figure 1-9: Natural branching versus man-made "cross-cuts" in south Delta channels.



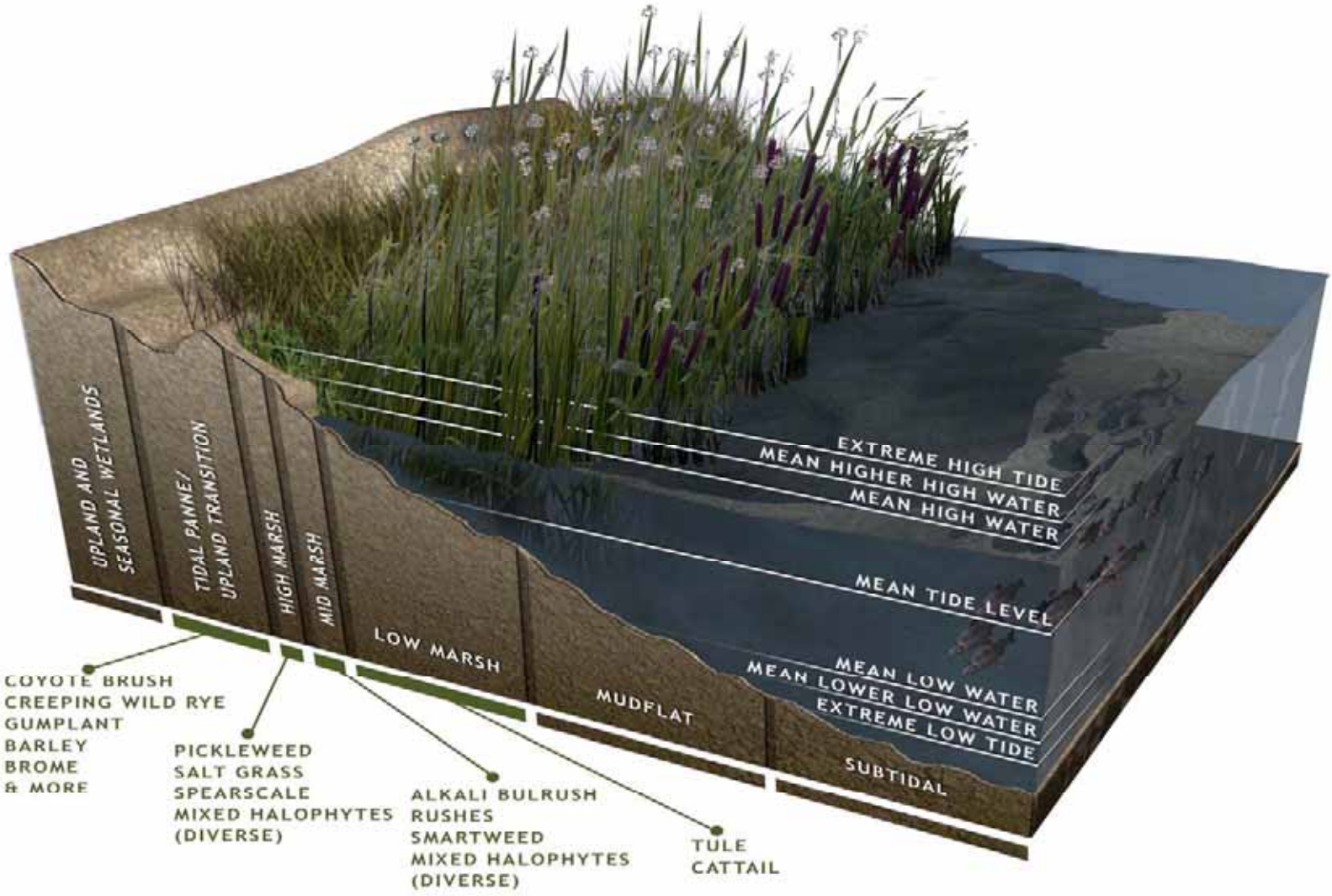
Natural branching channels in the Delta in 1873
(data from Delta Vision Status and Trends Report, 2007)



Channels in red are the man-made "cross-cuts" in the Delta of today
(data from Department of Water Resources Delta Atlas)

Source: Delta Vision Report, 2007

Figure 1-10: Cross Section of Connected Habitats



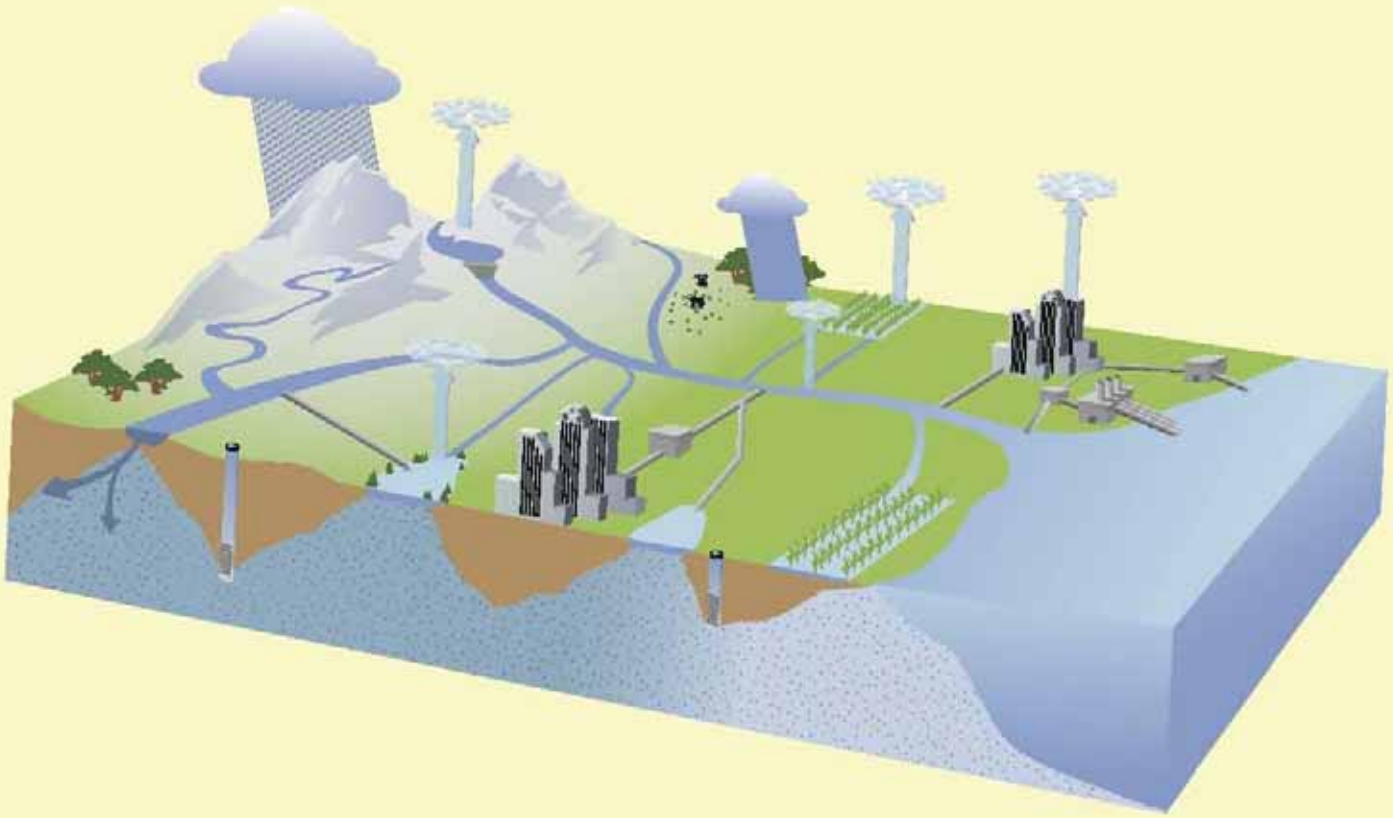
California Water Supplies and Uses (MAF)

	1998 (171% of normal)[a]	2000 (97% of normal)[a]	2001 (72% of normal)[a]
Total supply (precipitation & imports)	336.9	194.7	145.5
Total uses, outflows, & evaporation	331.5	200.4	159.9
Net storage changes in state	5.5	-5.7	-14.3
Distribution of dedicated supply (includes reuse) to various applied water uses			
Urban uses	7.8 (8%)	8.9 (11%)	8.6 (13%)
Agricultural uses	27.3 (29%)	34.2 (41%)	33.7 (52%)
Environmental water[b]	59.4 (63%)	39.4 (48%)	22.5 (35%)
Total dedicated supply	**94.5**	**82.5**	**64.8**

MAF = million acre-feet

a. Percent of normal precipitation. Water year 1998 represents a wet year; 2000, average water year; 2001, drier water year.

b. Environmental water includes instream flows, wild and scenic flows, required Delta outflow, and managed wetlands water use. Some environmental water is reused by agricultural and urban water users.



Key components of the illustrated flow diagram are shown as characteristic elements of the hydrologic cycle. Volume 3 Regional Reports has flow diagrams for statewide water summary (in Chapter 1) and for regional water summaries in their respective chapters.

Source: California Department of Water Resources, California Water Plan Update 2005

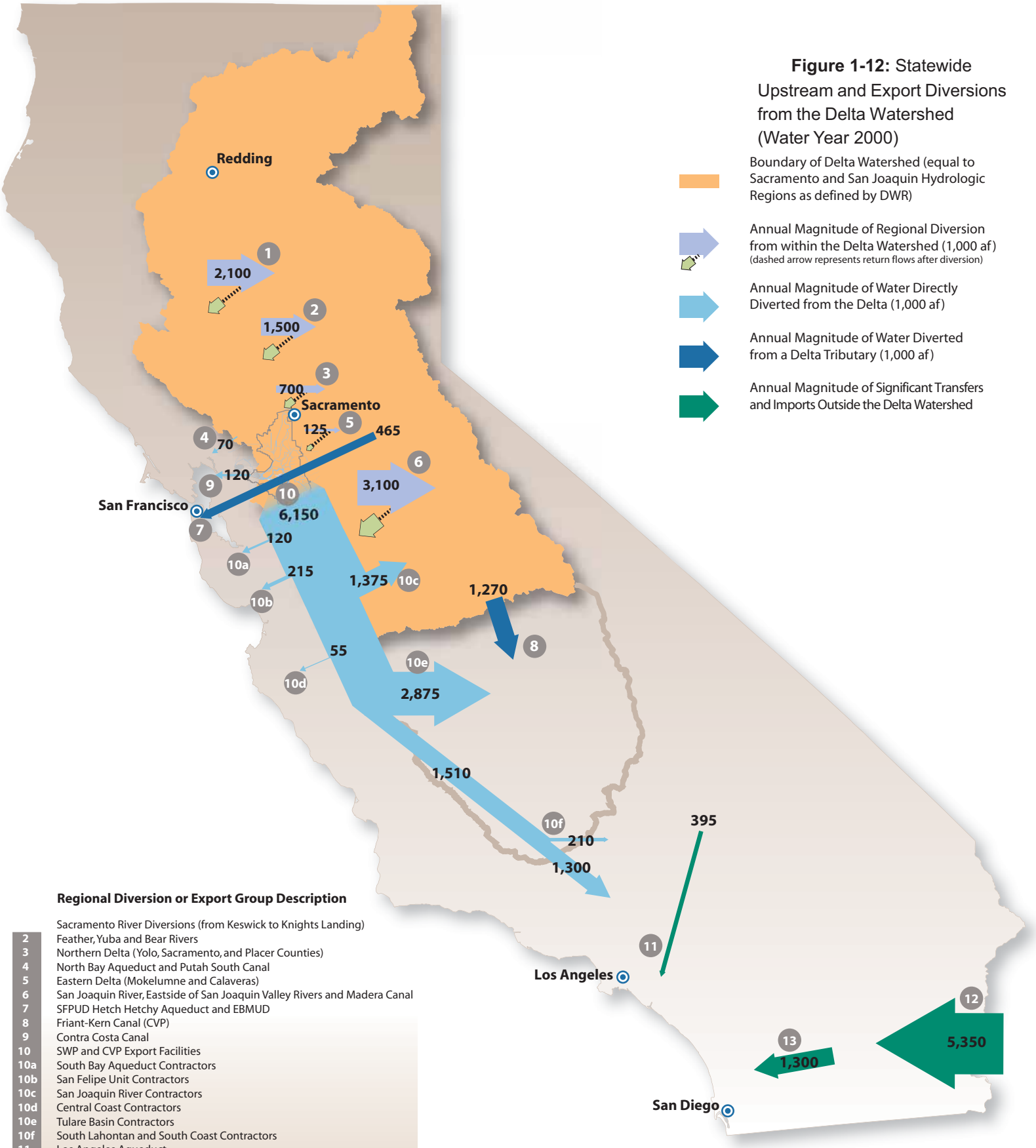


Figure 1-12: Statewide Upstream and Export Diversions from the Delta Watershed (Water Year 2000)

Boundary of Delta Watershed (equal to Sacramento and San Joaquin Hydrologic Regions as defined by DWR)

Annual Magnitude of Regional Diversion from within the Delta Watershed (1,000 af)
(dashed arrow represents return flows after diversion)

Annual Magnitude of Water Directly Diverted from the Delta (1,000 af)

Annual Magnitude of Water Diverted from a Delta Tributary (1,000 af)

Annual Magnitude of Significant Transfers and Imports Outside the Delta Watershed

Regional Diversion or Export Group Description

	Sacramento River Diversions (from Keswick to Knights Landing)
2	Feather, Yuba and Bear Rivers
3	Northern Delta (Yolo, Sacramento, and Placer Counties)
4	North Bay Aqueduct and Putah South Canal
5	Eastern Delta (Mokelumne and Calaveras)
6	San Joaquin River, Eastside of San Joaquin Valley Rivers and Madera Canal
7	SFPUD Hetch Hetchy Aqueduct and EBMUD
8	Friant-Kern Canal (CVP)
9	Contra Costa Canal
10	SWP and CVP Export Facilities
10a	South Bay Aqueduct Contractors
10b	San Felipe Unit Contractors
10c	San Joaquin River Contractors
10d	Central Coast Contractors
10e	Tulare Basin Contractors
10f	South Lahontan and South Coast Contractors
11	Los Angeles Aqueduct
12	Colorado River Aqueducts and All American Canal*
13	Colorado River Aqueduct

Source: DWR, 2005. California Water Plan Update 2005.

*Does not account for recovery of water California has stored in Lake Mead. California's current allotment from the Colorado River is 900 thousand acre-feet.

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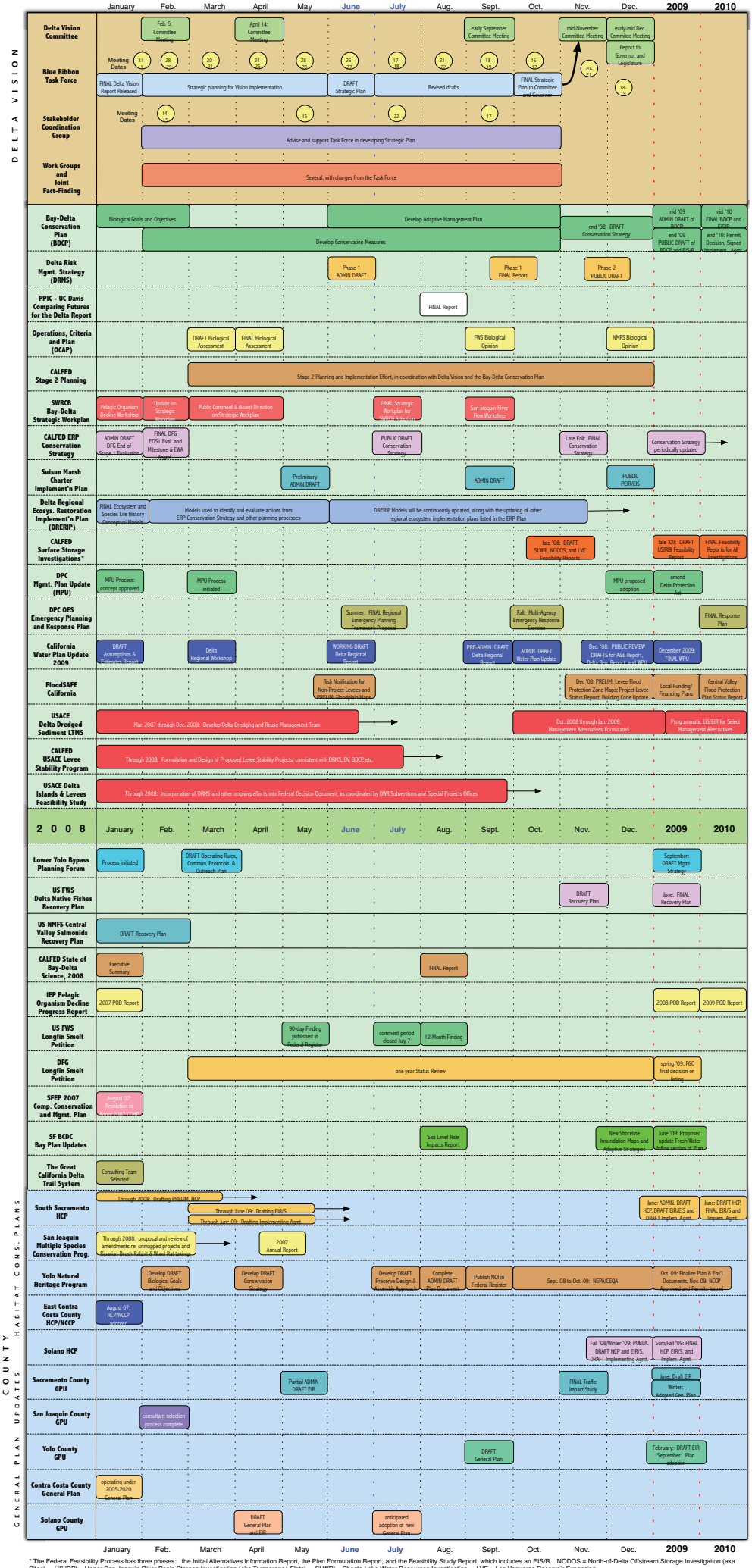
Figure 1-13: Delta and Suisun Policy Processes

prepared by Delta Vision and the CALFED Bay-Delta Program

Presented at Blue Ribbon Task Force Meeting
August 21-22, 2008



* The Federal Feasibility Process has three phases: the Initial Alternatives Information Report, the Plan Formulation Report, and the Feasibility Study Report, which includes an EIS/R. NODOS = North-of-Delta Offstream Storage Investigation (aka Sites) USJRBI = Upper San Joaquin River Basin Storage Investigation (aka Temperance Flats) SLWRI = Shasta Lake Water Resources Investigation LVE = Los Vaqueros Reservoir Expansion

Figure 1-14: DRAFT Potential Governance Structure - Fifth Staff Draft Strategic Plan

This diagram is a draft work product of Delta Vision staff and has not been seen or reviewed or endorsed by the Delta Vision Blue Ribbon Task Force.