

DELTA VISION STRATEGIC PLAN

Fourth Staff Draft

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

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<http://www.deltavision.ca.gov>

Comments to improve this draft are welcome at any time. Please send them to:

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Comments received before the following dates will be reviewed by staff as the draft strategic plan is revised for discussion at the subsequent Delta Vision Blue Ribbon Task Force meeting:

September 30

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A. Context¹

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.

Understanding our Strategic Plan involves first an overview of the seven goals it is designed to achieve, then the detailed implementation steps we recommend to achieve each goal. The seven goals:

- 1. Establish the Delta ecosystem and a reliable water supply for California as the primary, co-equal goals for sustainable management of the Delta.**
- 2. Protect the California Delta as a unique and valued place.**
- 3. Revitalize the Delta ecosystem to function as an integral part of a healthy estuary supporting native and migratory species.**
- 4. Drive California's water policies through conservation, efficiency, and sustainable use.**
- 5. Build new facilities for water conveyance and storage, and manage all facilities to achieve the co-equal goals.**
- 6. Reduce risks to people, resources, and state interests in the Delta.**
- 7. Create an effective governance system with the authority, responsibility and secure funding to achieve the co-equal goals.**

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/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.

¹ This section is adapted from Phil Isenberg, "Preface." Presented to the Delta Vision Blue Ribbon Task Force, August 22, 2008.

Notwithstanding this effort, disputes over water storage facilities, and how or if to improve the existing Delta water export system are unresolved.

Figure I-1: The 12 Vision Recommendations

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.

Californians like to fight about water. 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 generations past 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 helped to generate a good part of the current water policy deadlock.

There are some signs, faint but still clear, that the warring parties --- the aging water buffalos of our water policy water wars --- 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% per capita reduction in water use by 2020.

The current federal litigation about endangered fish species in the Delta is sobering for all the water buffalos and water system managers. 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 third 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.²

² 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,

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.

Figure I-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.

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 2030.³

In 2000, California farmers irrigated nearly 10 million acres with over 30 million acre feet of applied water. 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. Urban commercial applied water use varied between 1 million and 1.6 million acre feet between 1998 and 2000, the latest data available, reaching the highest value in the 2000. In the same time period urban industrial applied water use was essentially constant, between 0.5 and 0.6 million acre feet.⁴

Figure I-3: Water Use

March 5, 1770. (1824) Boston: William Emmons. 117. http://www.loc.gov/law/help/rare-books/pdf/john_adams_1824_version.pdf

³ 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) 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.

⁴ Data from the Department of Water Resources, *Water Plan Update 2009*, working draft background documents.

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 state wide scale.

- **The Delta ecosystem, by almost any measure, is in serious decline: threatened by the threat of catastrophic failure from earthquake, floods, sea level rise, global warming, land subsidence and urban development. These ecosystem threats equally threaten 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.⁵ Urban development is reducing wildlife habitat today and foreclosing opportunities to improve the ecosystem – and the Delta water conveyance system – in the future.⁶ The levee system has eliminated the dynamic land-water interfaces crucial for aquatic and riparian plants and animals.⁷

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

For the last 40 years, the federal government and California have adopted a wide array of laws and regulations to protect our environment.⁸ Many object to these laws and still call for repeal of the federal Endangered Species Act or the National Environmental Policy Act. In 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 affirms,

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

⁵ (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.

⁶ (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.

⁷ Florsheim, J., et al. (2008) "Bank Erosion as a Desirable Attribute of Rivers." *BioScience* 58(6): 519-529.

⁸ 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.

1 *Congress prescribed by the ESA... It is Congress that struck the balance in favor*
2 *of affording endangered species the highest of priorities. It is up to the political*
3 *branches of government, not the court, to solve the dilemma and dislocation*
4 *created by the required application of the law.*⁹
5

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

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

14 The current governance ‘system’ of water and the Delta includes more than 220 federal, state and
15 local government agencies! No person or group who submitted testimony to us supported the
16 current governance system. Most acknowledge that no real ‘system’ exists: everyone is involved;
17 no one is in charge.

18 All those who spoke to us about Delta governance said a change had to be made. It is not
19 surprising, of course, that each interest group believes only they should control any new
20 governance structure. We prefer and recommend a Governor appointed, State Senate confirmed
21 public body representing a statewide perspective, as we discuss further in this Strategic Plan.

22 Some cynics on the Task Force have suggested failure of policy-makers to achieve an agreed-
23 upon approach to solving the water and Delta ecosystem problems of California will inevitably
24 lead to federal and state court receiverships on the Delta and the water supplies that flow through
25 the Delta. For those of our readers who are attracted by the current federal court control of the
26 California prison healthcare system, well, you may be intrigued by a court takeover of our water
27 and ecosystem.

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

32 Finally, it is worth mentioning some unrealistic expectations --- call them urban myths --- which
33 influence the water/ecosystem debates in California

⁹ 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

1 California became a state 158 years ago. Ever since, legislatures, governors and the voters of
2 California have adopted a large number of laws that appear to promise unrealistic amounts of
3 water to every person, economic interest and region of the state.

4 All these promises exceed the available supply of water and expectations for increased water to
5 continue. Pending water right applications would divert an additional 4.2 million acre feet (MAF)
6 of water within the Delta water shed. Though these applications are unlikely to result in granting
7 of rights in the same order of magnitude, the applications do signal interest in receiving additional
8 water, a drive unlikely to end given population and economic growth.

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

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

15 Strong conservation measures are necessary whether you build dams or not. Mandatory
16 conservation, imposed both by local requirements or state requirements, seems inevitable, and
17 desirable. Physical improvements of the existing water systems of California (federal, state and
18 locally run), both in the Delta and around the State, are ways to help protect supplies from natural
19 disasters, and promote the more efficient use of water throughout California.

20 Yes, water storage systems should and will be built; the cost will be high, but the benefited users
21 will have to pay that cost. Yes, improvements in the Delta water export system will and should be
22 made. Our Task Force prefers a dual conveyance system, with a clear legal limit to total water
23 export placed in law.

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

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

30 For the next decades, however, the Task Force believes that resolving the competing demands
31 must rest upon good will, hard work, and a rational system of governance over water and
32 ecosystem issues. Conflicts over water should be decided through effective use of California's
33 water rights laws, which includes reasonable use and public trust principles.¹⁰

¹⁰ The Public Trust Doctrine is recognized and analyzed in *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419.

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

3 **A demand for guaranteed outcomes**

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

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

8 California state government cannot guarantee it will rain or snow heavily every year.

9 California state government cannot guarantee every water contract will be honored in full
10 every year; certainly not as long as the water supply is over subscribed.

11 California state government cannot guarantee t water prices will always be low. The
12 finite nature of water strongly suggests water prices will rise dramatically in years to
13 come.

14 California state government cannot guarantee every endangered fish species in the state
15 will be restored to a population level that existed decades ago.

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

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

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

B. The Delta in Crisis

Governor Arnold Schwarzenegger’s Executive Order S-17-06 launched Delta Vision in early 2007, a process to manage the Delta “over the long term to restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well-being of the people of the state”. This comprehensive effort addresses increasingly visible crises in ecosystems, levee failure risk, and uncertainty in the ability to provide water to the two-thirds of Californians who receive water from the Delta and its watershed. Our Delta Vision Blue Ribbon Task Force (Task Force) was created by this Executive Order, and directed to develop a Vision for the sustainable management of the Delta, and a Strategic Plan to implement that Vision.

Simultaneously, other governmental bodies were working to evaluate or develop plans for specific elements of the larger puzzle. The Delta Risk Management Strategy (DRMS) has assessed risks to Delta levees, and the Bay Delta Conservation Plan (BDCP) was initiated to achieve regulatory compliance of Delta water exports to endangered species laws. The urgency of these efforts has been magnified by growing recognition that existing institutions and policies are not addressing policy challenges effectively and likely will not be adequate for the future.

Intensifying conflicts

As Delta Vision has unfolded, legal uncertainty about the ability to protect species and export water has increased and drought has stressed water supplies. Likewise, water users throughout California have filed suits challenging other water users over a tightening supply. These battles in 2007 and 2008 intensified a long-standing conflict over the Delta and may be a harbinger of more battles to come:

- In two high-profile legal cases, federal judge Oliver Wanger invalidated biological opinions and policies adopted 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 summer 2007 to reduce entrainment 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 in the populations of most major open-water (a.k.a. pelagic) fish species, which began early in the decade, continued. Populations of the Delta smelt fell to record-low levels, sparking serious concerns about possible extinction. In 2008, the State of California took the unprecedented step of prohibiting salmon fishing statewide for the entire year to help populations rebound.

- 1 • The California Fish and Game Commission identified longfin smelt as a candidate
2 species under the California Endangered Species Act and adopted emergency regulations
3 governing incidental take during the 12 month candidacy period. The U.S. Fish and
4 Wildlife Service (USFWS) took the first steps toward possible listing of longfin smelt
5 under the federal Endangered Species Act.
- 6 • Two consecutive years of low precipitation and snow pack accumulation led Governor
7 Schwarzenegger to declare an official drought in June 2008 and to declare a drought
8 emergency in nine Central Valley counties a month later. Between 250,000 and 275,000
9 acres of annual agricultural crops were abandoned in the Central Valley that summer, due
10 to reduced water supplies.
- 11 • Many water districts across the state urged conservation and some established mandatory
12 water use reductions.
- 13 • Inter-regional legal disputes regarding the role of the Delta in water supply increased:
 - 14 ○ Five water agencies (Contra Costa Water District, Alameda County Flood
15 Control and Water Conservation District, Metropolitan Water District of
16 Southern California, Santa Clara Water District and Alameda County Water
17 District) reliant on Delta water initiated a challenge, based on the California
18 Environmental Quality Act (CEQA), against the Sacramento Regional County
19 Sanitation District's plans for long term expansion and calling on the SWRCB to
20 take action.
 - 21 ○ The Central Basin Municipal Water District (Los Angeles County) filed suit
22 against the drought water allocation plan adopted by the Metropolitan Water
23 District of Southern California.
 - 24 ○ The San Joaquin River Group filed a letter with the State Water Resources
25 Control Board (SWRCB) alleging illegal water diversions in the central and
26 south Delta. This challenge alleges a pattern of overuse of water by Delta
27 agricultural users.

28 ***Figure I-4: Long-Standing but Recently Intensifying Conflicts in the Delta***

29 To compound the growing number of inter-regional battles, and major litigation, three events in
30 particular shaped the context in which Delta Vision was created.

- 31 • In 2005, Hurricane Katrina tragically revealed that even the relatively well engineered
32 levee system protecting New Orleans could be breached, with ruinous consequences.
33 California policymakers subsequently realized that Delta levees, in their current form, are
34 not sufficient to protect against existing earthquake and flood risks, much less future
35 climate change impacts.

- In 2003, the decision of the California Supreme Court in *Paterno v. State of California* established that the state has potential liability for the failure of any levee it has even partially financed or constructed, potentially exposing California taxpayers to very large liability burdens. The state passed a package of floodplain laws in fall of 2007 to improve flood control throughout the Central Valley and reduce liability, but there is continuing concern that development in floodplains such as the Delta will increase risks and liabilities to the state as a whole.
- In 2005, the state's Little Hoover Commission also recognized the CALFED process, launched by the Bay-Delta Accords in 1994 and formalized by the CALFED Record of Decision in 2000, had failed to meet its goals of managing the Delta for sustainability. In particular, CALFED was criticized for its voluntary nature, 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" (E.O. S-17-06).

Water crises around the world

California's Delta is not alone in facing a 21st century water crisis with 20th century infrastructure and institutions.

- The Colorado River Basin has just experienced an eight-year drought revealing that earlier allocations cannot be sustained. As a consequence of this, and growing population and demands in the Upper Basin states, the amount of water California is able to draw from the river has fallen 18% since 2003.
- Looking east across the United States, since 1990 the Missouri River system has been the focus of nearly a dozen lawsuits, with the recent drought dividing upper and lower basin interests in multiple states, and placing flood control and navigation in stark opposition with endangered species preservation. The federal government appears to be moving glacially to remove endangered human populations from floodplains, not simply paying to rebuild after periodic flooding.
- The Great Lakes-St. Lawrence River Basin is looking at an estimated \$15 to \$20 billion in restoration and cleanup costs associated with invasive species and raw sewage discharge. The eight states bordering the Great Lakes, and two Canadian provinces, recently signed an interstate compact for sustainable management of the watershed of the lakes, including provisions for conservation, reporting of all water diversions, managing ground water and limiting diversions outside the watershed. The compact is now pending before Congress which must approve interstate compacts.
- 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 state drought policies, applied at the county level. In May 2008, 55 counties remained subject to level four restrictions, under which most types of outdoor watering are

1 prohibited. Landscape watering is limited to one person with one hose for 25 minutes per
2 day on an odd-even schedule between midnight and 10 AM.

3 • Looking across the Atlantic, France, Germany, Britain, and the European Union have all
4 adopted major legislation in the past decade to try and balance needs for flood control,
5 surface and groundwater management, water quality, and endangered species.

6 • By the year 2050, the Netherlands will return an estimated 220,000 acres to floodplains,
7 natural forests, and marshlands, designate 62,000 acres of pasture as temporary
8 floodwater storage pools, and require 185,000 acres of farmland to adopt land use
9 practices that tolerate soggy conditions in the winter and spring; the estimated spending is
10 between \$19 and 25 billion over the next 50-100 years.

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

16 ***Figure I-5: Global Water Crises***

17

C. Future Changes

Delta Vision’s charge is intergenerational in scope “...to develop a durable vision for sustainable management of the Delta.” Our Strategic Plan recommendations therefore must take into account the changes we know are coming to the Delta and provide capacity to adapt to unforeseen changes. For the most part, these changes are outside of the state’s control; some are global in nature. But responsible governance and management of the Delta must anticipate them if we are to secure the co-equal values, and enhance the Delta’s place values, over several decades. All of these future changes will have major impacts on the Delta.

Population growth will drive greater need for efficiency and conservation

The state’s population is expected to grow substantially in the coming decades, as it has throughout California’s history. The California Department of Finance expects the state’s population to exceed 48 million by 2030, and the growth likely will not stop there.

Demand for new water diversions throughout the watershed will also grow inexorably unless major changes are made in how we manage water in the state. An analysis by the State Water Resources Control Board showed that up to 4.2 million acre-feet of new water rights applications are already pending before the Board. While some of these applications will not be pursued and others are judged unlikely to be successful, demand for water in the Delta watershed will increase. In addition, growing populations may also produce higher loads of contaminants washing into the Delta to damage water quality, unless major efforts at source control are made.

With expected growth of this magnitude, there is no alternative to greatly improving water conservation and efficiency throughout the state. Apart from whatever new supplies ocean desalination may produce, there simply isn’t a major source of new water in the state that could meet anywhere near this much demand. With California’s share of the Colorado River declining, and stress on the Delta already unacceptably high, efficiency improvements and alternative supply development are the only paths forward for the state.

Within the Delta region itself, population growth rates are projected to be even higher than in the state as a whole. The populations 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 more than 7.5 million by 2050, according to demographer Hans Johnson of the Public Policy Institute of California. The portions of these counties within or near the legal Delta have been the fastest growing in recent decades, partly because they are within commuting distance of the job-rich Bay Area.

Climate change will heighten 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. Climate change will likely have several significant effects on the Delta:

- 1 • There will likely be more critically dry years, increasing the need for large amounts of
2 water to be moved and stored throughout the state when it is relatively abundant.
- 3 • A projected sea level rise of 55 inches by 2100 will increase pressure on Delta levees and
4 increase salinity intrusion from the tides.
- 5 • A likelihood of slightly wetter winters with less snowpack, and smaller spring and
6 summer inflows, will make it harder to repel salinity in the west Delta, and will harm
7 water quality by producing more concentrated agricultural return flows and wastewater
8 discharges.
- 9 • Storms are expected to become more intense, increasing the potential for large river
10 floods.
- 11 • Water temperatures in Delta channels will increase, which may harm important native
12 fish species.
- 13 • Higher temperatures in crop-growing regions will increase irrigation demands.
- 14 • Water temperatures in the ocean will increase, potentially altering marine food chains and
15 further threatening salmon and other anadromous fish that migrate through the Delta.

16 ***Figure I-6: Summary of Projected Global Warming Impact, 2070-2099***

17 Overall, climate change will tend to exacerbate many of the Delta's most difficult challenges. The
18 timing mismatch between the availability of water and the demand for it will likely get wider.
19 The pressure on levees will become significantly greater, both on a daily basis and during flood
20 events. And the conditions under which the ecosystem will need to be managed will likely
21 become more changeable and uncertain.

22 Climate change could also open up new opportunities for the management of the Delta and its
23 watershed. Early experiments have shown that Delta soils may be extremely well suited to
24 sequester carbon. The state's climate change mitigation efforts under AB32 will ultimately create
25 a system under which carbon emission credits are priced and traded, potentially creating a
26 lucrative new industry for Delta farmers.

27 Policies that make sense for the Delta today will make even more sense as climate change
28 unfolds. Indeed, the knowledge of what climate change will likely bring us makes it all the more
29 urgent that needed changes to the Delta system begin today.

30 **Subsidence and seismic threats will continue to mount**

31 Land subsidence has already put most of the Delta primary zone several feet below sea level,
32 making the levees the only thing preventing these islands from being permanently flooded. Land
33 subsidence is continuing through soil oxidation, with large areas of the Delta expected to lose up
34 to five more feet of elevation.

Subsidence of soils and sea level rise will combine gradually to exert greater and greater pressure on levees, as the gap grows between sinking land elevations and rising sea levels. Levee failure probabilities will increase even faster, unless significant upgrades in levees are made.

Figure I-7: Effects of Growing Subsidence on Delta Levees

Levees are also threatened by earthquakes. The U.S. Geological Survey estimates a roughly 2-in-3 chance that the Bay Area will experience a large-magnitude earthquake before 2032, likely along one of the six faults that lie relatively near the Delta. The Department of Water Resources (DWR) and CALFED have estimated that such an event could cause up to 30 levees to break, flood thousands of homes and farms, and interrupt water exports indefinitely due to saltwater intrusion into the southern Delta. The cost to the California economy could run as high as \$40 billion.

In addition, seismic pressures build over time. The longer we go without experiencing such an event, the higher the probability that it will be devastating when it does happen. Although there is no historical record of levee failure in the Delta, the period since 1906 has been relatively quiet seismically, and future planning cannot ignore the USGS projections.

New invasive species will arrive

The Delta is already one of the most invaded estuaries in the world, and it is highly likely that new invasive species will continue to arrive in the coming decades. Existing invasives, particularly the clams *Corbula* and *Corbicula*, have had an enormous impact on the ecosystems of the Delta, profoundly altering entire food webs to the detriment of natives. Almost 200 non-native species exist in the Delta, and they constitute 95 percent or more of the biomass.

New invasives are almost certain to arrive in the Delta in coming decades. Quagga mussels and zebra mussels are of particular concern since they are also voracious consumers of plankton, which form the base of the food chain. Many other species could also arrive, with unknown effects.

The water-energy link

The California water system both produces and consumes large amounts of energy. Over the next several decades, energy policy will evolve substantially as prices rise and new carbon emissions regulations come into 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 amounts of water around the state will become more expensive. The State Water Project is one of the largest consumers of energy in the state. Over the long term, the price of energy will directly influence the price of water, making energy demands of alternative water sources more important in investment decisions. Conservation and efficiency improvements will become even more cost-competitive as energy prices rise.

D. Strategies for a Better Future

The Delta is in crisis, and with it, the entire state of California faces an unprecedented threat to its environment and prosperity. If the Delta continues on its current path, we face a future of continuing environmental degradation and resulting water supply restrictions. If the Delta were to fail catastrophically, the state of California would likely face an environmental and economic crisis of enormous proportions – many lives lost, tens of billions of dollars in costs, and irreparable damage to the Delta’s environment and culture.

Our Vision made 12 integrated and linked recommendations to chart a better future for this indispensable resource. We argued strongly – and still do – that these recommendations must be carried out together, with no “cherry picking” of ideas that suit one interest group or another. Our recommendations are linked because the Delta’s challenges are linked. There can be no sustainable and reliable water supply without a healthy Delta ecosystem free of court-ordered species protection actions. At the same time, the Delta ecosystem would not remain healthy for long if the state’s economy were suffering for lack of water.

We also identified the Delta region itself as a unique and valued place. This is the third foundational leg of the Vision and the Strategic Plan. Though the co-equal values of water supply reliability and ecosystem health are primary, concern for the fate of the Delta as a place must also inform the management of the system. As decisions about water flows, habitat investments and other requirements of the co-equal values are made, the consequences for the Delta as a place must be weighed carefully to ensure its economic and cultural vitality are not unduly harmed.

To make our twelve Vision recommendations a reality, the state of California must attain seven goals that derive from these recommendations and form the backbone of this Strategic Plan:

- 1. Establish the Delta ecosystem and a reliable water supply for California as the primary, co-equal goals for sustainable management of the Delta.**
- 2. Protect the California Delta as a unique and valued place.**
- 3. Revitalize the Delta ecosystem to function as an integral part of a healthy estuary supporting native and migratory species.**
- 4. Drive California’s water policies through conservation, efficiency, and sustainable use.**
- 5. Build new facilities for water conveyance and storage, and manage all facilities to achieve the co-equal goals.**
- 6. Reduce risks to people, resources, and state interests in the Delta.**
- 7. Create an effective governance system with the authority, responsibility and secure funding to achieve the co-equal goals.**

These are the goals to which our strategies are addressed. Each of these goals contains a set of indicators that form the basis of our Report Card measuring progress toward the realization of the Vision (see page 28). The strategies we recommend to reach these goals, and the reasoning behind them, are described below. We provide an overarching portrait of our strategic direction here, but the detailed content of the strategies, including specific actions required to carry them out, is presented in Volume 2.

Goal 1: Establish the Delta ecosystem and a reliable water supply for California as the primary, co-equal goals for sustainable management of the Delta.

All strategies developed to address the next six goals contribute to achieving this goal.

Figure I-8 Delta Map

Goal 2: Protect the California Delta as a unique and valued place.

Strategy 2.1: Utilize State and Federal special designation areas to reinforce the value and uniqueness of the Delta

The Delta's value comes not just from the economic or infrastructure services it provides to the state, but also from its intrinsic worth as a community with a distinct natural and cultural heritage. The Delta should continue to thrive not only as a key component of the state water system and the estuary, but for its own sake.

We propose three major ways of recognizing the Delta's unique value and enhancing its future. First, the Delta should be designated as Natural Heritage Area by the federal government to communicate its stature as one of America's most distinctive and culturally significant regions. Second, we recommend the State create a major new State Recreation Area in the region, and provide incentives for the further development of the recreation and tourism economy throughout the region.

Third, we propose that the state assist Delta agriculture in selected adaptations. Farmers are inventive, knowing their lands and markets, and continually make decisions regarding what to produce. Broad national and state agricultural policy supports these farming practices and will continue. Some additional policies specific to the Delta can support agriculture in meeting its unique potential to become a model for sustainable, high-value and profitable crop production that supports other Delta policy goals. The Delta's unique soils, growing conditions, and farming traditions allow it to innovate in areas of agriculture such as carbon sequestration crops, subsidence reversal crops, wildlife-friendly crops, and crops for direct marketing to the very large urban populations nearby.

Delta agriculture is the heart of the regional economy and important 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 in the face of unpredictable changes. Though land forms 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 remain robust. Government can also support farmers taking advantage of new opportunities to grow crops unique to the region, such as carbon sequestering crops, or to add value to existing agricultural operations, such as with agri-tourism ventures.

The Delta is facing a future characterized by substantial risks. It is critical that strategies for regional protection be robust in the face of those risks. The Delta's regional economy and profile within the state can, and should, continue to grow in the coming decades even if some levees fail. The Delta's potential to become a major recreational destination for the millions of people who will move to northern California in the coming decades is virtually unlimited. The infrastructure investments required to take advantage of this potential, however, should be concentrated in locations above sea level or where levee failure risks are low.

Figure I-9 a, b, c: Three Components Support Protection of the Delta as a Place

Goal 3: Revitalize the Delta ecosystem to function as an integral part of a healthy estuary supporting native and migratory species.

Strategy 3.1: Restore extensive interconnected habitats, especially critical land-water interfaces, within the Delta and Delta watershed.

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 species by reducing risks of entrainment and predation.

We must revitalize the Delta ecosystem on a large scale by restoring each of the habitats that existed in the historic Delta – tidal marshes, floodplains, seasonal grasslands, and 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 even require changes in current agricultural land uses. But the revitalization of the Delta ecosystem requires these habitats, and these habitats require specific land elevations and other conditions if they are to thrive. If the co-equal values are to be met, and the Delta's environment is to be sustained for future generations, we have little choice but to begin these restorations immediately in carefully identified locations, and sustain our commitment to the ultimate goal over decades.

Figure I-10: Cross-section of Connected Habitats

The Delta was originally a vast, sea-level tidal marsh intermixed with large areas of open water, surrounded by seasonal floodplains grasslands. These habitats were fed by strong seasonal pulses of fresh river water and twice-daily infusions of nutrients from the tides. 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 it possible.

The full-scale restoration of this ecosystem is both impossible and undesirable. Nor is it adequate, however, merely to return the Delta to the ecological conditions preceding the major fish crashes of recent years. The task for California today is to restore the underlying ecosystem structures, functions and processes that will make a thriving Delta ecosystem possible in the 21st century and beyond. Such an ecosystem will possess six key characteristics:

- Viable populations of native resident and migratory species;
- Functional corridors for migratory species;
- Diverse mosaics of habitats and ecosystem processes;
- Flows to support habitats and processes;
- Stressors below adverse effects levels;
- Ability to provide important human services.

Revitalizing the ecosystem to meet these six key characteristics requires conducting a suite of interrelated strategies, all of which must be implemented. The strategies of restoring habitats, reducing stressors, and establishing corridors (listed above) must be joined with the strategies of achieving Delta flows to support the co-equal values (see Goal 1) and the adaptive management of the system (see Goal 7).

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

Strategy 3.5: Achieve sufficient water quality improvements to meet drinking water, agriculture, and ecosystem long-term goals

As conflict over the Delta has intensified, major court rulings have made clear that a “mitigation only” approach is not sufficient to manage the co-equal values. Comprehensive ecosystem revitalization is a much better long-term strategy for achieving that goal because it a) better supports diverse species at any given point in time, b) is less fragile to major disruptions, and c) increases opportunities for adaptation to changing circumstances such as sea level rise or increases in temperature. An effective ecosystem revitalization strategy of sufficient scale should also reduce future listings of species as threatened or endangered.

California will have to improve water supply reliability and revitalize the Delta ecosystem as part of a single comprehensive program, in which scheduling, permitting, and financing of major water supply and ecosystem projects are linked. We have specific goals related to the ecosystem, water use efficiency, and facilities (see below), but meeting both of the co-equal values requires intensive management of two issues in particular – freshwater flows and water quality.

Figure I-11: Co-equal Goals Supported by Linked Water Supply and Ecosystem Projects

Meaningful revitalization of the Delta ecosystem requires improvement in freshwater flow conditions. Appropriate flows provide habitat, trigger reproduction and migration, carry nutrients and organisms to other parts of the estuary, maintain and improve water quality, and promote

habitat complexity and diversity. The “flow habitat” of the Delta has been homogenized over time by human regulation of inflows, continually high water exports, and the “short-cutting” of channels by man-made canals, especially in the south Delta.

Figure I-12: Natural Branching versus Man-Made Cross-Cuts in South Delta Channels

Our Strategic Plan identifies the current recommendations about appropriate freshwater flows for the Delta ecosystem:

- Increase Delta outflow between February and June
- Ensure positive flow in the south Delta between February and June
- Reconfigure the shape of Delta waterways to increase variability in estuarine circulation patterns and increase aquatic access to floodplains and tidal marshes
- Increase base flows and utilize pulse flows on the San Joaquin River to improve water quality

Analysis about the precise quantities involved, and the effects of these flow recommendations on water supply reliability, must proceed as part of the adaptive management of the system (see page 26 below). The recommendations may need to be refined later to ensure that acceptable supply reliability is achievable under these conditions.

Management of water quality is also essential to the co-equal values. Some contaminants, such as mercury, agricultural pesticides and urban runoff degrade water quality for both the co-equal values, and we urge source control efforts as part of this Strategic Plan. But with others water quality constituents, the situation is more complex. Water intended for human consumption or agricultural irrigation should have low levels of organic carbon and salinity. But the overall productivity of the ecosystem *cannot* increase without more organic carbon, because it is the foundation of the food chain. Limited periods of elevated salinity may also favor native aquatic species over invasives, but this is less certain.

These water quality complexities suggests that Delta managers will need greater flexibility in managing flows, and that intakes for water diversions should be moved to locations away from habitats where organic carbon (and perhaps salinity) should be increased. As we recommend be further analyzed, a dual conveyance facility and re-located in-Delta intakes will reduce this conflict. These facilities, in combination with increased storage, would allow managers to send water through the Delta by different paths at different times (if necessary), and also to draw water from flowing channels, where quality for human use is higher, rather than dead-end sloughs.

Goal 4: Drive California’s water policies through conservation, efficiency, and sustainable use.

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

Strategy 4.2: Increase regional self-sufficiency through diversifying water supply portfolios while not impacting flows into the Delta

1 California has made major strides in water use efficiency and conservation in recent decades,
2 mostly due to the efforts of local and regional water districts. Indeed, it is their hard-won
3 experience in managing these programs – and proving their effectiveness – that gives us
4 confidence that conservation and efficiency can and should be implemented even more
5 aggressively.

6 Dramatically improved water use efficiency, conservation, and alternative supply development
7 must be the bedrock of California policies at the local, regional, and state levels. Diversions from
8 the Delta watershed – upstream, within, and exported from the Delta – are an issue of statewide
9 importance because of their impact on the co-equal values. With population continuing to grow,
10 demand for these diversions will grow as well, putting greater and greater pressure on the Delta
11 and its tributaries. Our strategy calls for linking state funding for water projects of all kinds to
12 achievement of specific benchmarks on efficiency, conservation, and development of alternative
13 supplies.

14 ***Figure I-13: Statewide Upstream and Export Diversions from the Delta Watershed***

15 Reducing or avoiding demand wherever it is economically feasible to do so should be the first
16 option in meeting these challenges. The specific opportunities available will vary widely across
17 California. The per capita rates of consumption and the economic uses of water differ greatly
18 across the state, and therefore the conservation and efficiency investments that make economic
19 and social sense will differ as well. That is why decisions on such investments must occur at the
20 local and regional level. The state's role is to provide broad policy guidance and to ensure,
21 through funding mechanisms and other means, that state interests are being met.

22 Conservation and efficiency by themselves will not resolve California's water challenges.
23 Alternative supplies, such as reused water, recycled water, storm water, and desalinated water
24 must take a much greater role in all districts' water supply portfolios. As the state has already
25 recognized through its Integrated Regional Water Management Program, such localized
26 alternative supplies are preferable to moving stored water long distances. The more each region
27 of California can rely on these supplies, the less stress is placed on the Delta ecosystem as a
28 "switching yard" for huge quantities of water moving around the state.

29 ***Figure I-14: Strategies to Reduce Demand or Increase Water Supplies***

30 Conservation, efficiency, and alternative supplies all have one critically important thing in
31 common – they are highly reliable. Once the initial investments are made, these strategies will be
32 very predictable and stable components of any district's supply portfolio for a long time to come.
33 The same cannot be said of supplies diverted from the Delta watershed or other major systems
34 such as the Colorado River. In the coming century, the most reliable – and therefore the most
35 valuable – water supplies will be those that can be obtained with the least damage to the
36 environment.

37 **Goal 5: Build new facilities for water conveyance and storage, and manage all**
38 **facilities to achieve the co-equal goals.**

1 *Strategy 5.1: Expand options for conveyance, storage and reservoir operations to meet*
2 *long-term demands in light of likely future changes in the Delta*

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

4 California's hydrology is highly variable, as shown in Figure I-2. Native aquatic ecosystems,
5 including the Delta, are adapted to that variability, but water users need predictable and consistent
6 access to water (either flowing or stored). For the co-equal values to be advanced, this difference
7 in needs and priorities must somehow be reconciled.

8 We need to ensure water can be moved and stored when it is least harmful to the environment,
9 and that the stored water is accessible to purveyors and users at times of their choosing. We use
10 the term "wet-period diversion system" as shorthand for this principle, recognizing that the very
11 wettest periods also have special ecological value that should not be sacrificed. Nonetheless, we
12 must take advantage of abundance when it exists, so that conflict between water needs and
13 ecosystems can be reduced during the dry periods.

14 In our Vision, we argued that conveyance and storage facilities in the Delta watershed, the Delta
15 itself, and the export areas would have to be improved, and better linked, in order to meet this
16 goal. Given what we know today, it appears to us the best option for Delta conveyance is a two-
17 channel (or "dual") conveyance that combines a single through-Delta channel (likely Middle
18 River) with an isolated facility. This has multiple advantages over the current system:

- 19 • It expands overall capacity so larger amounts of water can be moved across the Delta
20 *when it is least harmful to the ecosystem and the Delta itself.*
- 21 • It expands management flexibility so water can be conveyed in a variety of ways,
22 depending upon the needs of the ecosystem and the Delta region.
- 23 • It reduces entrainment risks to fish in the south Delta at times of our choosing.
- 24 • It allows some (and at times, all) critical drinking water supplies to be diverted from free-
25 flowing river channels where quality is higher, rather than dead-end locations in the south
26 Delta where quality is lower.

27 As our Vision emphasized, however, improved conveyance across the Delta serves little purpose
28 without places both north and south of the Delta to store the water. Though there is currently
29 more storage in southern California than can be filled (because of Delta pumping restrictions),
30 over the long term demand growth and climate change will put storage at a premium. Though we
31 call for the immediate completion of the state's Surface Storage Investigations and
32 implementation of any options that optimize the capture of wet-period flows, we also emphasize
33 the development of floodplain storage for both stormwater and flood management that supports
34 groundwater storage, which will be a critical part of any storage system. We recommend specific
35 actions to integrate information about groundwater into water planning throughout the state, and
36 urge state funding for various water projects be made contingent upon the timely completion of
37 such planning.

1 **Goal 6: Reduce risks to people, resources and state interests in the Delta.**

2 *Strategy 6.1: Match the level of protection provided by Delta levees and uses of land and*
3 *water enabled by those levees*

4 *Strategy 6.2: Ensure appropriate land uses in the Delta*

5 *Strategy 6.3: Proceed immediately with actions necessary to achieve levels of emergency*
6 *protection consistent with federal and state policies*

7 Scientists conclude the Delta faces enormous risks of levee failure – as high as a two-in-three
8 chance of mass levee failure in the next 30 years, by one estimate. Even without catastrophic
9 events, levee maintenance and strengthening against sea level rise and subsidence requires
10 effective policies and continued investments. And yet the projected expense of fully fortifying all
11 levees in the Delta against catastrophic events and sea level rise – tens of billions of dollars – is
12 out of the question. The State must reduce risks to life and property (and its own potential
13 liabilities for levee failures) in an equitable and economically rational manner, without creating
14 an unsustainable “fortress Delta.”

15 ***Figure I-15: Delta Levee Failure***

16 We recommend this be accomplished by matching levee designs to land uses throughout the
17 Delta. There are two sides to the risk equation – the quality of levees, and the value of the land
18 uses and services they protect. The more intensive the land use in a particular place, the more
19 robust levees should be. But equally important, in areas where levees are inadequate, intensive
20 land uses such as housing should not be built. Avoid new urban development as a justification for
21 levee improvements or a levee strengthening financing method. Link prudent land use decisions
22 for long-term public safety, and environmental and water supply protection to avoid harm to both.
23 Over time, as levees are selectively strengthened and wiser land use choices are made, risk will be
24 reduced, to the benefit of the Delta and its residents and the state as a whole.

25 ***Figure I-16: Delta Levee Designs***

26 Delta levees also provide important services to the co-equal values. They help protect the Delta
27 from major saltwater intrusion from the tides, and they shape the flows of fresh water through the
28 region. The value of these services for water supply reliability and ecosystem management must
29 be recognized in decisions about levee designs.

30 There is one additional way to reduce risks in the Delta: ensuring that people living in the region
31 are prepared for emergencies. We strongly urge emergency preparedness exercises, planning, and
32 other urgent emergency management actions move forward immediately. If a major disaster were
33 to strike the Delta without proper emergency drills, evacuation planning, and pre-positioning of
34 materials, California will have no one else to blame for the resulting loss of life and economic
35 damage.

Goal 7: Create an effective governance structure with the authority, responsibility, and secure funding to achieve the co-equal goals.

Finding there is now no effective way to achieve the recommendations made in our adopted vision for the Delta, we called for a more effective governance structure in the Delta that would "...ensure integrated action to implement this vision." (Delta Vision. 2007: pg 17). That recommendation remains sound. Figure I-17, showing the various policy efforts now underway regarding the Delta is graphic representation of the current fragmentation. Success in achieving the goals of Delta Vision requires substantially greater capacity for sustained coherent action than is possible with current institutions.

Figure I-17: Delta Planning Efforts

Most Californians receive water supplies from systems designed and primarily constructed before passage of modern species protection laws. The Wanger cases, in particular, have unambiguously signaled that water delivery systems must now comply with species protection laws. Moreover, the remedies imposed by Judge Wanger also signaled 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." (In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings [S138974], slip opinion at pg. 26).

This Supreme Court opinion identifies reducing or capping Bay-Delta water exports as one option to satisfy both state and federal species laws. The California water rights system, which includes reasonable use and public trust, provides the legal framework for decisions about how to provide any water required for ecosystem purposes. In the past, water right holders and water agencies have also used private agreements, exchanges and other approaches to reach accommodation to changed water availability. If effective, these tools can be used in the future as well.

Crises of ecosystem deterioration and water supply interruption have physical solutions, such as alternative conveyance, but our ability to decide upon, implement and adjust these solutions as necessary is a governance challenge. 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 all aspects of Delta management.

The new governance system must be capable of making and implementing effective policies in a context of deep conflict over goals, changing circumstances (such as climate change), unforeseen events (including new invasive species or catastrophic levee failures), evolving scientific understanding of basic processes and of effective policy tools, and certain imperfection in policy implementation. The governance system must be capable of learning and adapting in difficult circumstances of high risk and high value to society.

The new governance system recommended here is tightly focused on the minimum actions required to satisfy the charge given to Delta Vision and includes:

- A new governance body, the **California Delta Ecosystem and Water Council** (Council), which will replace the existing California Bay-Delta Authority. The Council will have the responsibility to:
 - Adopt a California Delta Plan to achieve the goals of our Vision and this Strategic Plan and
 - The authority to determine consistency with the Plan, when reviewing actions of state agencies and to use provisions of the Coastal Zone Management Act to address any inconsistencies in actions of federal agencies
 - Allocate funds to programs and projects consistent with its plan
- A new body, the California Delta Conservancy, created to implement the Delta ecosystem restoration, consistent with our Vision and this Strategic Plan.
- Expanded authority for the existing Delta Protection Commission, including authority over historical areas in the Delta, and responsibility for management of the proposed National Heritage Area designation for the Delta:

Existing state agencies retain existing authorities. The Department of Water Resources, California Department of Fish & Game, State Water Resources Control Board and other state agencies will retain their existing authority. The ongoing effective exercise of their authorities in the following areas is critical to the success of this recommended governance system:

- ✓ For the science and regulatory implementation of species protection laws, the California Department of Fish and Game and the federal United States Fish and Wildlife Service (USFWS) and NOAA's National Marine Fisheries Service (NMFS).
- ✓ 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 USFWS and NMFS, through the CALFED Ecosystem Restoration Program and the successor programs to be 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 Council.
- ✓ For municipal functions, including police powers and service provision, which contribute to the value of the Delta as place, existing local governments.

Strategy 7.1: Create the California Ecosystem and Water Council, replacing the existing California Bay-Delta Authority, create a new Delta Conservancy to implement ecosystem restoration projects and enhance the role of the Delta Protection 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: Establish an effective adaptive management framework to support ecosystem revitalization

Strategy 7.4: Finance the activities called for in the CDEW Plan through effective and transparent financing tools that minimize reliance on general fund appropriations.

Figure I-18: Proposed Governance Structure (Draft)

The California Legislature should create a California Delta Ecosystem and Water (CDEW) Council to replace the Bay-Delta Authority and subsume CALFED programs. The Council should replace both the Bay-Delta Authority and subsume programs of CALFED. Since some continuing federal funds are budgeted to CALFED, the Council would assume any remaining authority and program responsibility. Council operations should begin in July 2009.

The Council should consist of five to seven voting members, including a chair. No geographic, occupational or representational criteria are proposed for these appointments. Such an approach invites argument over categorization to be included in the original legislation and then arguments over whether or not an individual fits the categories. Instead, the criteria used for appointment of the Delta Vision Blue Ribbon Task Force in Executive Order S-17-06 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 by the Governor to five year terms and confirmed by the State Senate.

The Council’s primary responsibilities and authorities would be to develop and adopt a CDEW Plan, incorporating the elements of relevant plans from other agencies where appropriate, and to use its powers to achieve consistency of action with that adopted Plan.

1 The California Legislature should create a California Delta Conservancy to be responsible for
2 implementation and coordination of Delta ecosystem enhancement and related revitalization
3 projects. The Conservancy should be devoted solely to the legal Delta and the Suisun Marsh. It
4 should be governed by a 13-15 voting member body, including both local and state officials, with
5 selected federal participation in non-voting roles.

6 The California Legislature should strengthen the Delta Protection Commission (DPC). The Delta
7 Protection Commission was created in 1992 and given appellate review of proposed land uses in
8 the Delta primary zone. The DPC membership should be expanded with representation of the
9 Central Valley Flood Board, the U. S. Army Corps of Engineers, and a representative of each city
10 (with city votes weighted by population). The DPC would also receive direct permitting authority
11 for projects within the primary zone and selected other changes in roles.

12 Successful governance of the Delta will depend on a coherent, effective and reliable financing
13 structure. That system will include financing to pay capital costs, revenue generation, procedures
14 for expenditure as approved by the CDEW Council, and obligations placed upon recipients of
15 benefits from those expenditures.

16 Financing will require a flexible approach. We do not yet know all the benefits, costs, obligations,
17 and risks that will be involved, and must therefore move forward with a certain level of
18 uncertainty. Commitments to transparency, cost effectiveness, incentives and criteria for
19 efficiency will expedite financing processes in the face of uncertainty. New participants will be
20 identified and new funding sources developed. We must also maximize the availability and use of
21 federal funding, and access all currently available bond funding.

E. Act While Learning

Our Vision emphasized the Delta’s challenges are characterized not only by their complexity, but also by their uncertainty. As we pointed out, however, “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.

Uncertainty in the Delta and in policy making

There are two kinds of uncertainty in the Delta ecosystem. One is we simply do not understand fully how the system works now. 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, so it is difficult 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 we cannot predict. That is, even if we understood the system perfectly now, we still could not predict its future behavior with certainty. What’s more, 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.

Defining adaptive management

Adaptive management is defined by the federal government as follows:

“Adaptive management is 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.”

Importantly, 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 and best available policy tools. Adaptive management equally commits to observing, analyzing and understanding the results of those prior actions. Finally, adaptive management requires the political, managerial and operational capacity to design and implement improved actions.

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

9 The CDEW plan recommended here has the advantages of integrating the actions of many
10 relevant agencies and also of being regularly revised on five year cycles. These regular reviews
11 and updates also provide a schedule of review activities in which to gain the value of stakeholder
12 participation. This rhythm of review cycles also requires organizing scientific understanding and
13 program assessment to a point where they can inform policy making.

F. Reporting Progress

Assessing, evaluating, and reporting progress toward achieving the Delta Vision is critical to successful adoption, funding, and implementation of the 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 appropriate corrective action if needed. Clearly communicating how well the Delta is doing also informs the public about how well the Strategic Plan is working, and promotes trust.

Establishing indicators, assigning performance measures and targets, and measuring and monitoring the status of performance measures is a common method used to evaluate whether our proposed strategies are effective 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 and effectiveness 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 appropriately or if resource reallocation is necessary.

One way of charting progress towards realizing the Vision is the use of “Report Cards.” Report cards are effective tools for integrating assessment results and communicating scientific understanding to policy makers and to the general public. These cards rely on indicators, performance measures, and targets to report progress in a timely and synthesized format which is accessible to a broad audience. They have been used successfully in other complex planning arenas, such as the Chesapeake Bay.

To evaluate and report progress toward achieving the Vision, one summary-level indicator was identified for each Strategic Plan goal. (The collective performance of all indicators serves to evaluate Goal 1.) Sub-indicators were selected when necessary to capture different aspects of performance.

Goal	Indicator
Goal 1: Establish the Delta ecosystem and a reliable water supply for California as the primary, co-equal goals for sustainable management of the Delta.	(Success is evaluated by the collective performance of the indicators below.)
Goal 2: Protect the California Delta as a unique and valued place.	Delta Recognition and Value
Goal 3: Revitalize the Delta ecosystem to function as an integral part of a healthy estuary supporting native and migratory species.	Estuary Health
Goal 4: Drive California’s water policies through conservation, efficiency, and sustainable use.	Water Sustainability
Goal 5: Build new facilities for water conveyance and storage, and manage all facilities to achieve the co-equal goals.	Water Supply Reliability
Goal 6: Reduce risks to people, resources, and state interests in the Delta.	Delta Risk

Goal	Indicator
Goal 7: Create a governance system with the authority, responsibility and secure funding to see that the co-equal goals are achieved.	Government Effectiveness

1
2 Each indicator is comprised of several “reporting level” performance measures, each of which has
3 an associated target and timeline. Each performance measure will be monitored and evaluated
4 regularly by an independent assessment team. Progress toward meeting each performance target
5 will be expressed by the team as a percentage of target attained. To report status towards
6 achieving the Vision, progress towards meeting performance targets will be rolled up into one
7 score or grade for each indicator (or sub-indicator, where applicable). Similar to the integration
8 and linkage of all 12 Vision Recommendations, success toward realizing the Vision cannot be
9 claimed unless *all* indicators are performing well.

10 These indicators and their components will be tracked, along with the status of strategy
11 implementation, and reported to policy makers and the public through a Delta Vision Report
12 Card, which will be issued by an independent and objective board on a regular basis. The Report
13 Card will provide essential feedback to the Council regarding Vision realization and individual
14 strategy success. The Report Card will indicate if implemented strategies are working, or it may
15 signal to policy makers that a course adjustment is necessary.

16 Table 1 in the Appendix shows which performance measures are proposed for each indicator.
17 Note that Goal 1 is represented by a roll-up of all indicators and performance measures, so is not
18 listed here. These are interim measures, to be refined by the Delta Science and Engineering Board
19 and the CDEW Council before July 2009.

G. Near Term Actions

As in the adopted Vision, the Delta Vision Blue Ribbon Task Force again recommends near term actions. These are critical actions which warrant initiating as soon as possible as they either allow more effective policy making and implementation or address immediate threats to the Delta inhabitants and ecosystem, or to water conveyance systems.

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 much water use in the state is unreported. The legislature should enact legislation requiring universal, consistent reporting on water diversion and use for all water agencies and any substantial diverter.

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 reported use becomes 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 SWRCB or DWR. The reports for 2006 to 2008 should be provided by March 1, 2009 and are due annually for the immediate past year thereafter.

2. 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 decision making by the State Water Resources Control Board.

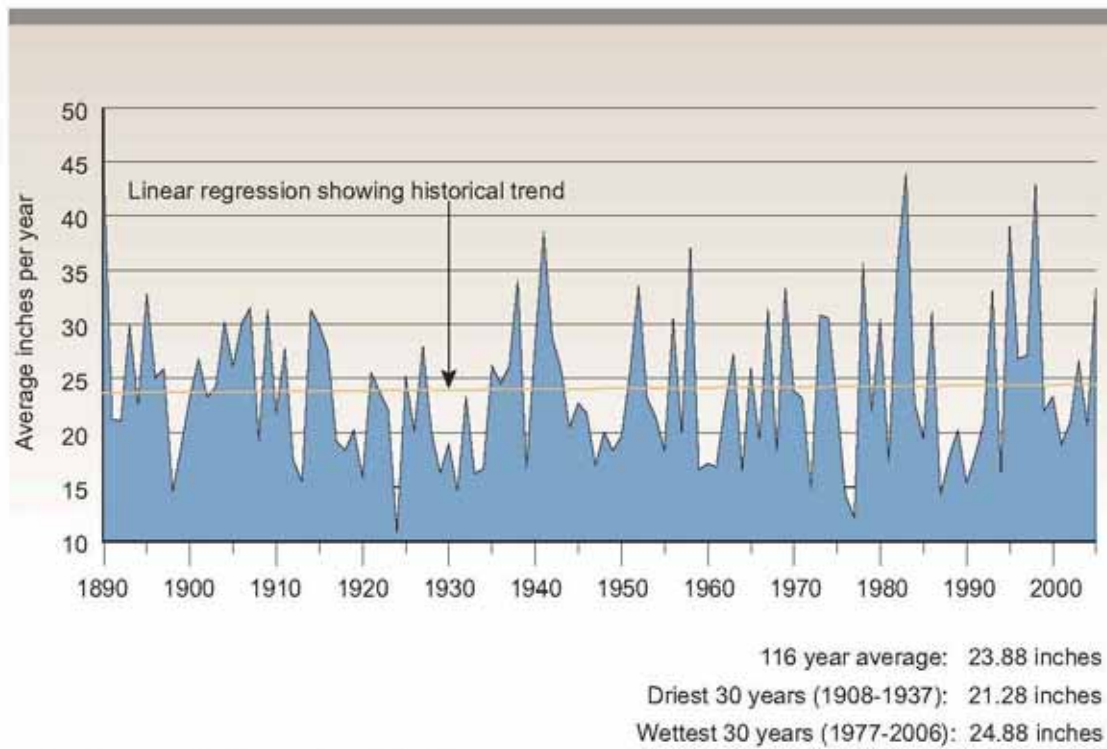
3. Assess and improve capacity of the State of California to respond to catastrophic events in the Delta

Local governments and the DPC are developing emergency response plans and capacity. 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 values in the Delta. The assessment should be completed by June 2010 and presented to the Governor and the Delta Protection Commission, as a forum for engaging Delta local governments.

Figure I-1: Our adopted Vision (2007) included 12 interrelated and linked 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.

Figure I-2
History of California Percipitation



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

Figure I-4
Long-Standing but Recently
Intensifying Conflicts in the Delta

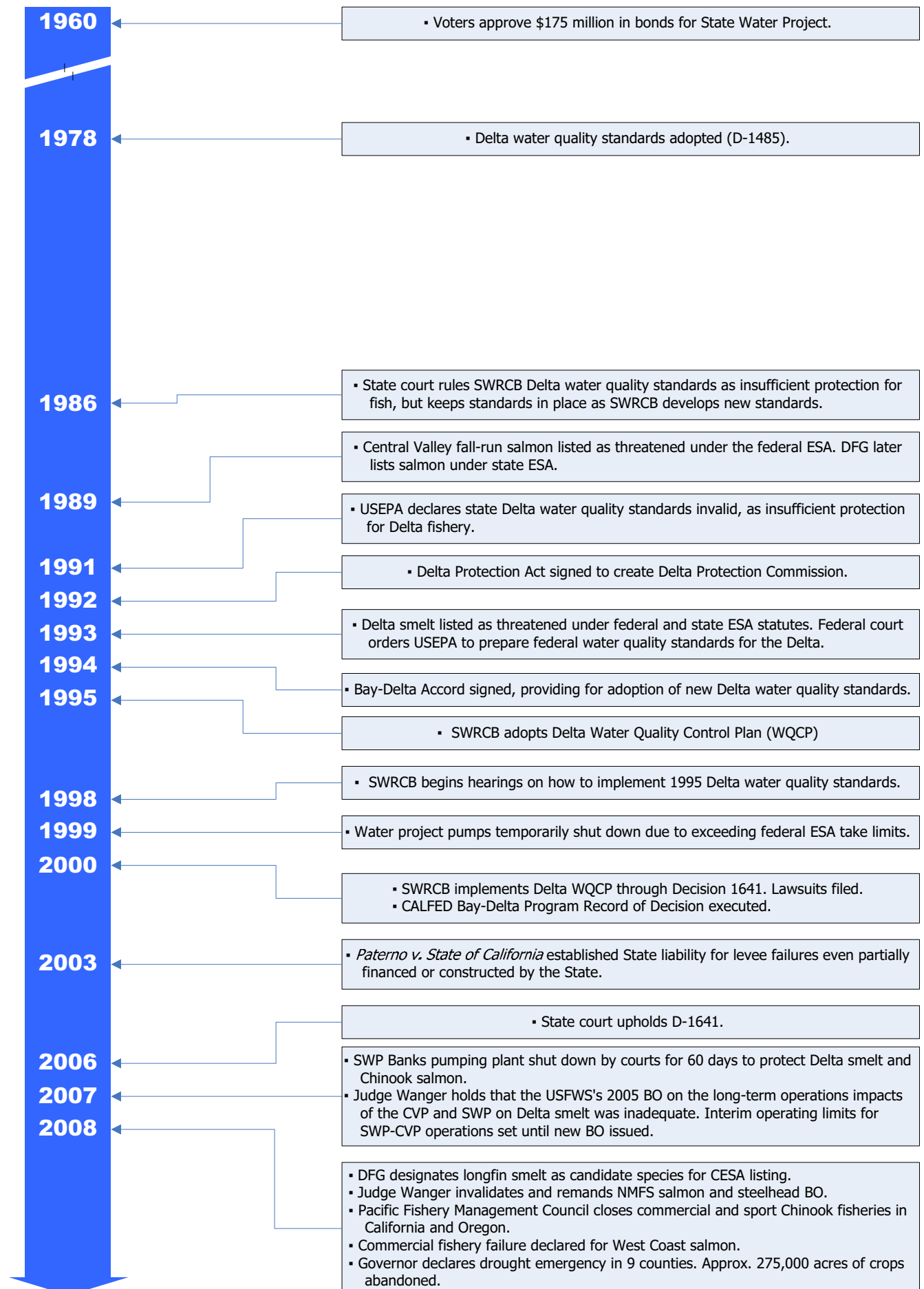
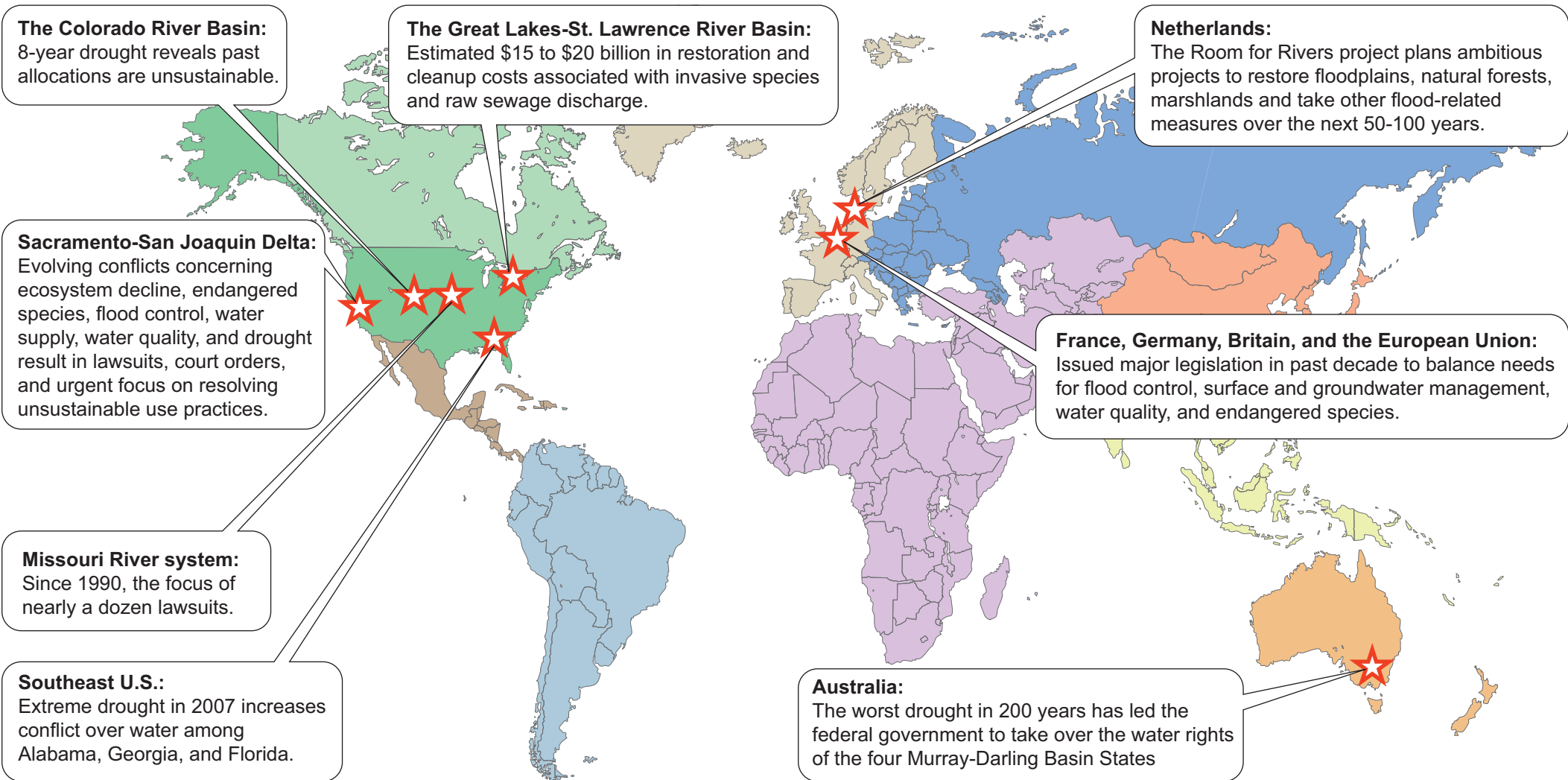
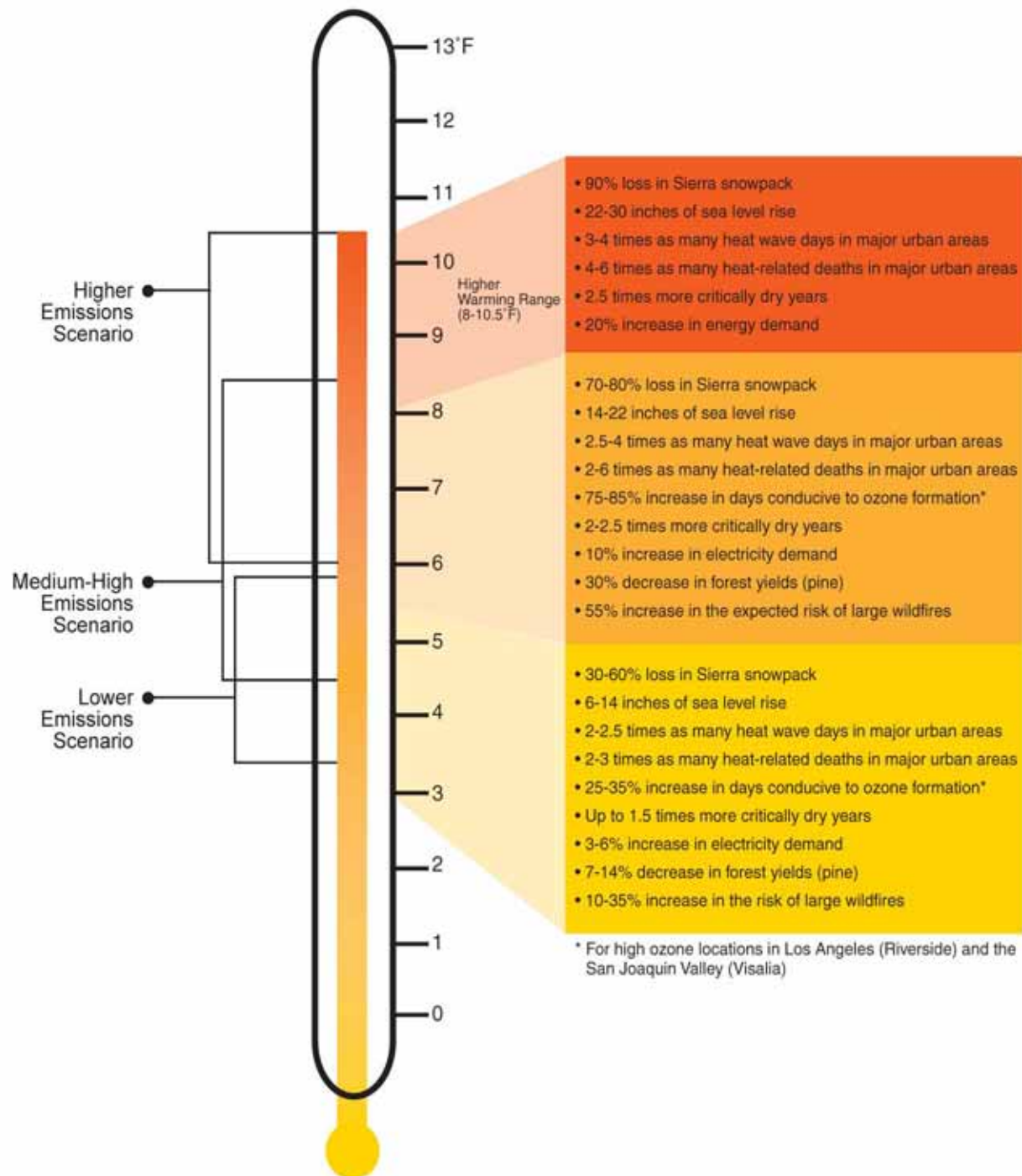


Figure I-5
Global Water Crises





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)

Figure I-7
Effects of Growing Subsidence
on Delta Levees

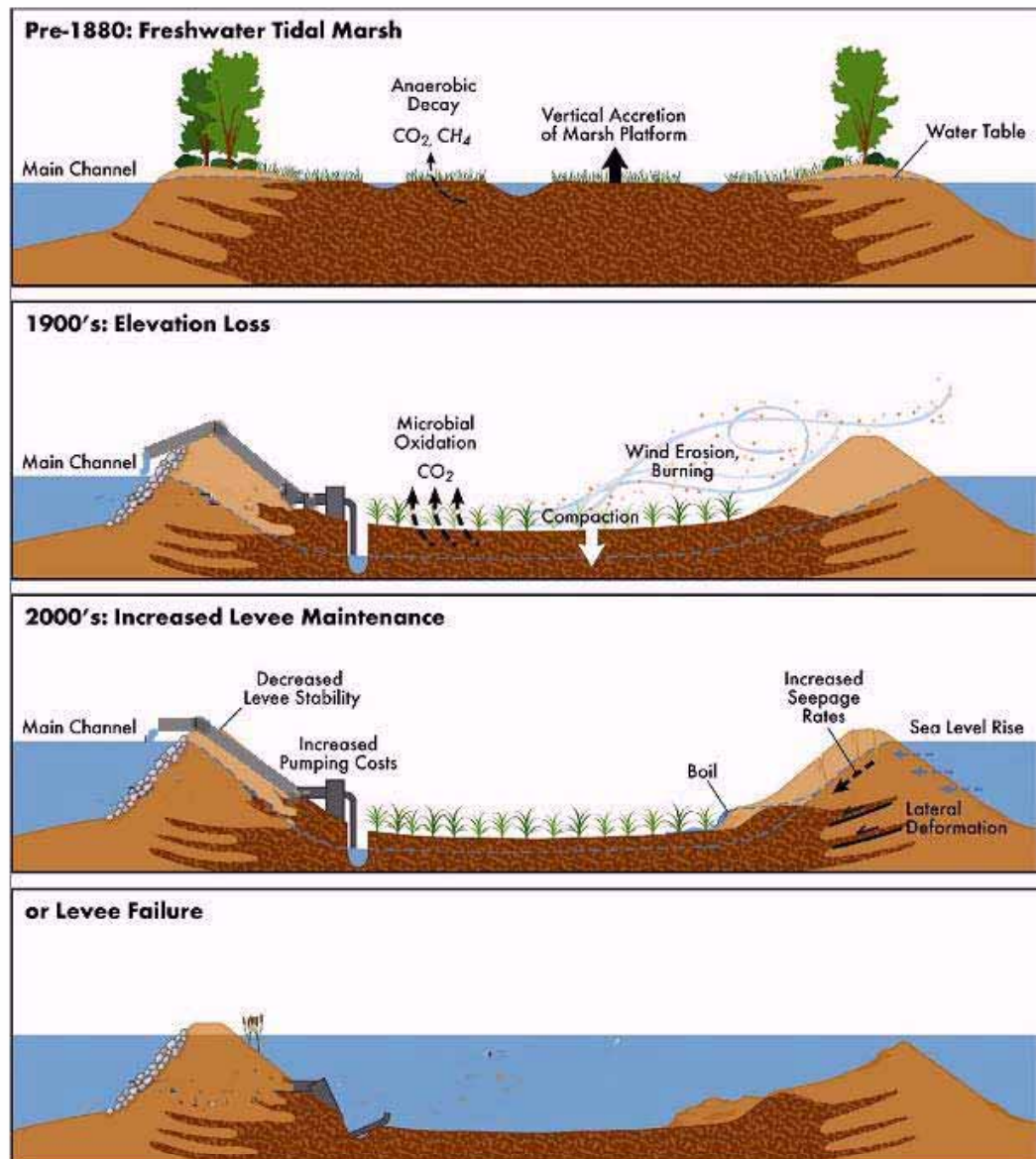
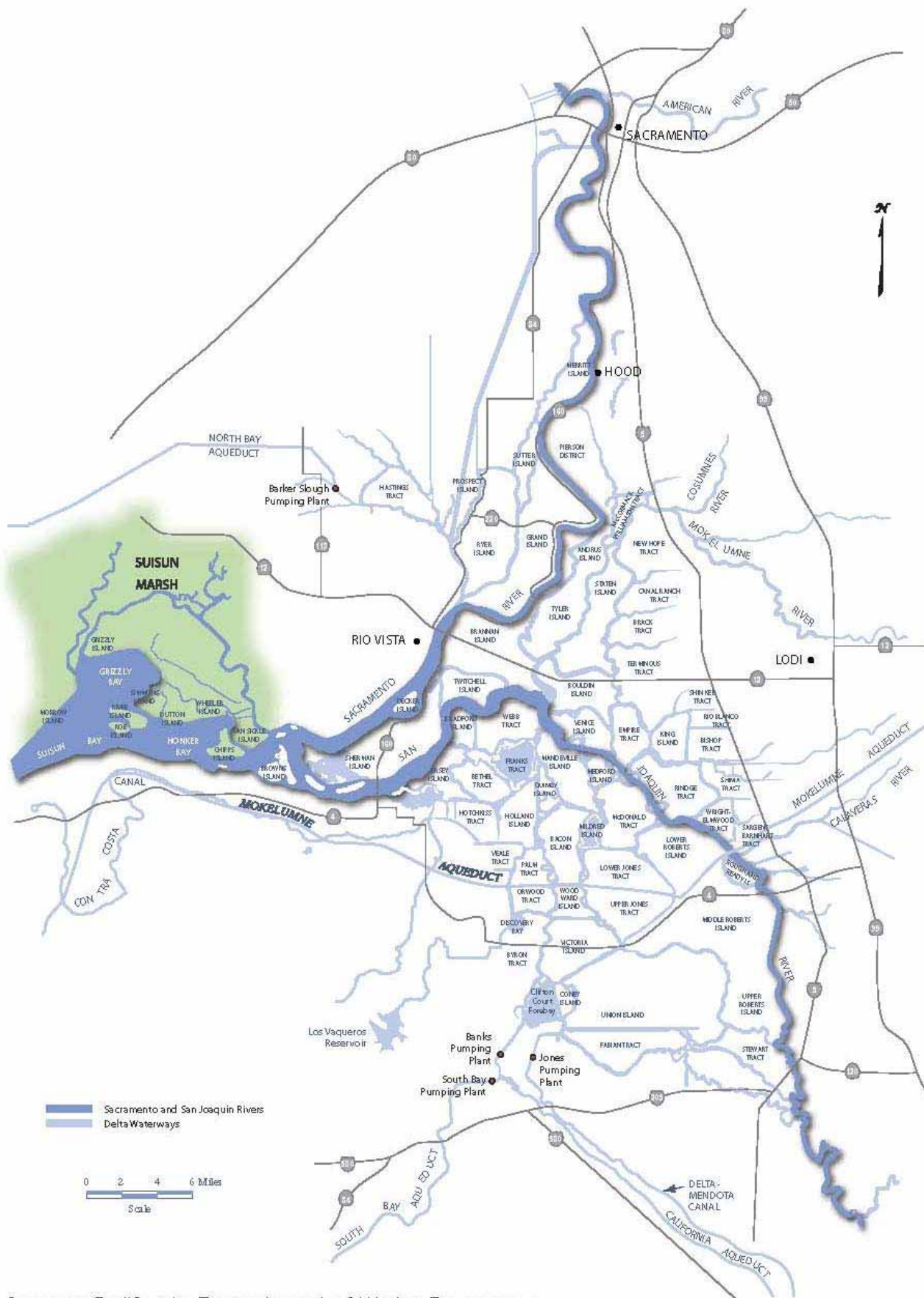


Figure I-8
Delta Map



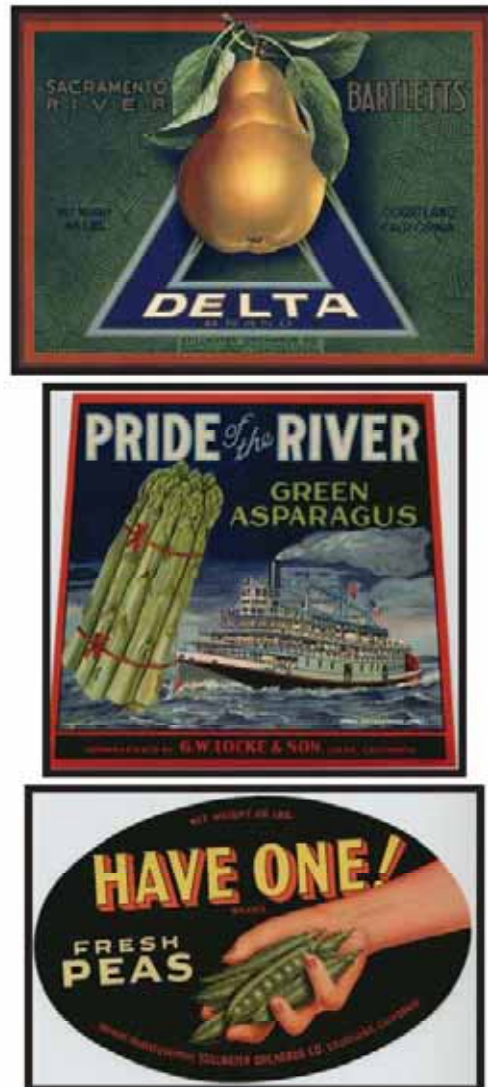
Source: California Department of Water Resources



Figures 1.24. Promotional Material for The Netherlands route, 1911. Source: California State Railroad Museum

Figure I-9b
Three Components Support
Protection of the Delta as a Place

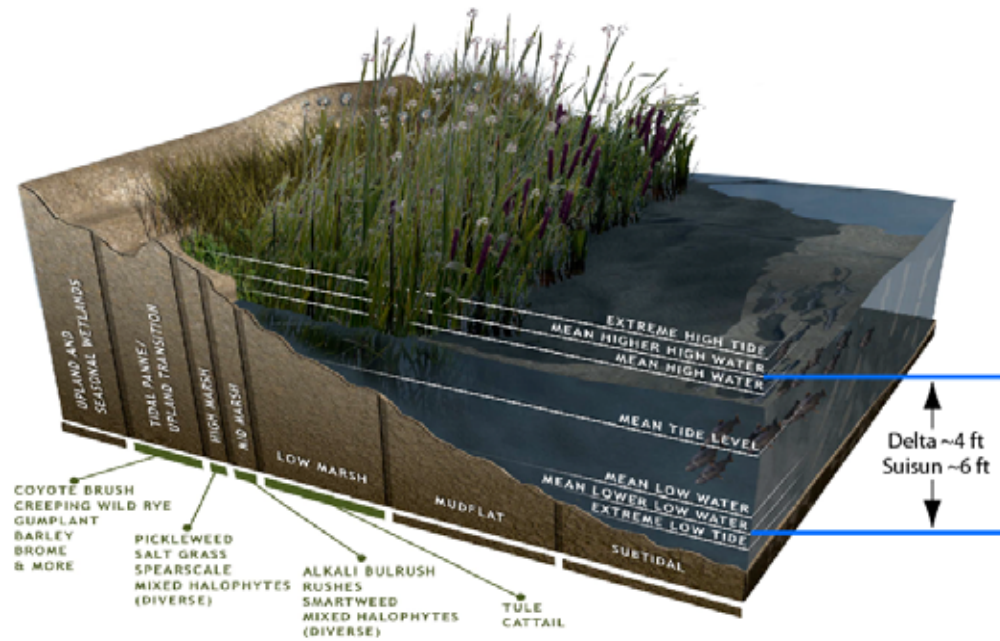




Figures 1.36a-1.36c. Produce labels from the Delta, 1910s-1930s. *Source:* www.thelabelman.com/

Sectional view of typical tidal marsh in the Delta/Suisun region

(courtesy of Stuart Siegel, Wetlands and Water Resources, Inc., from Moffat and Nichol)

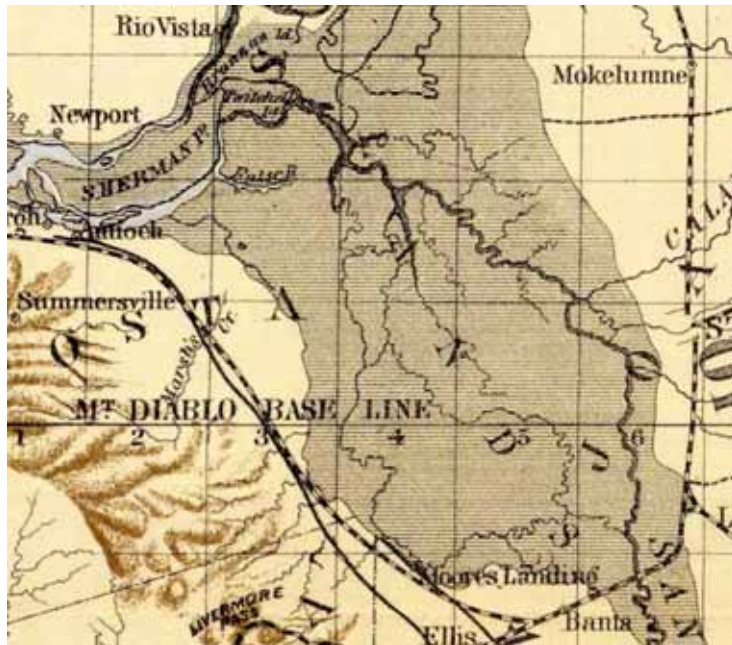


COMPREHENSIVE CO-EQUAL PROGRAM

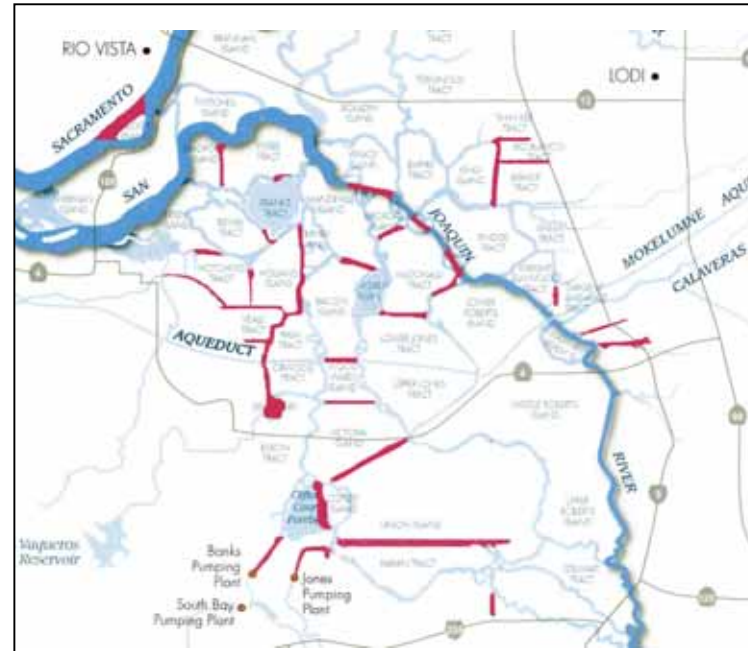
Achieve Measurable Co-equal Goals



Natural branching versus man-made “cross-cuts” in south Delta channels.

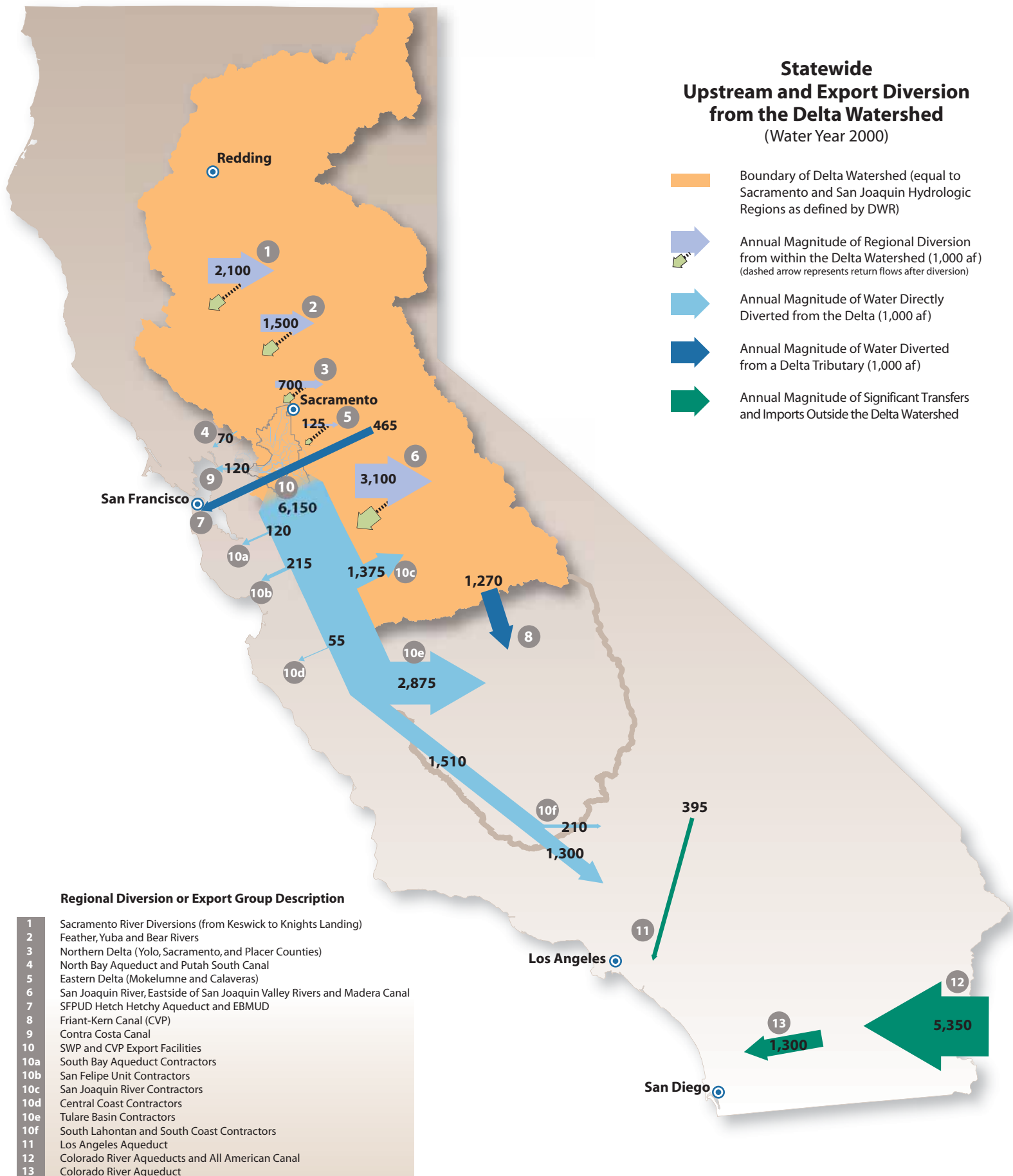


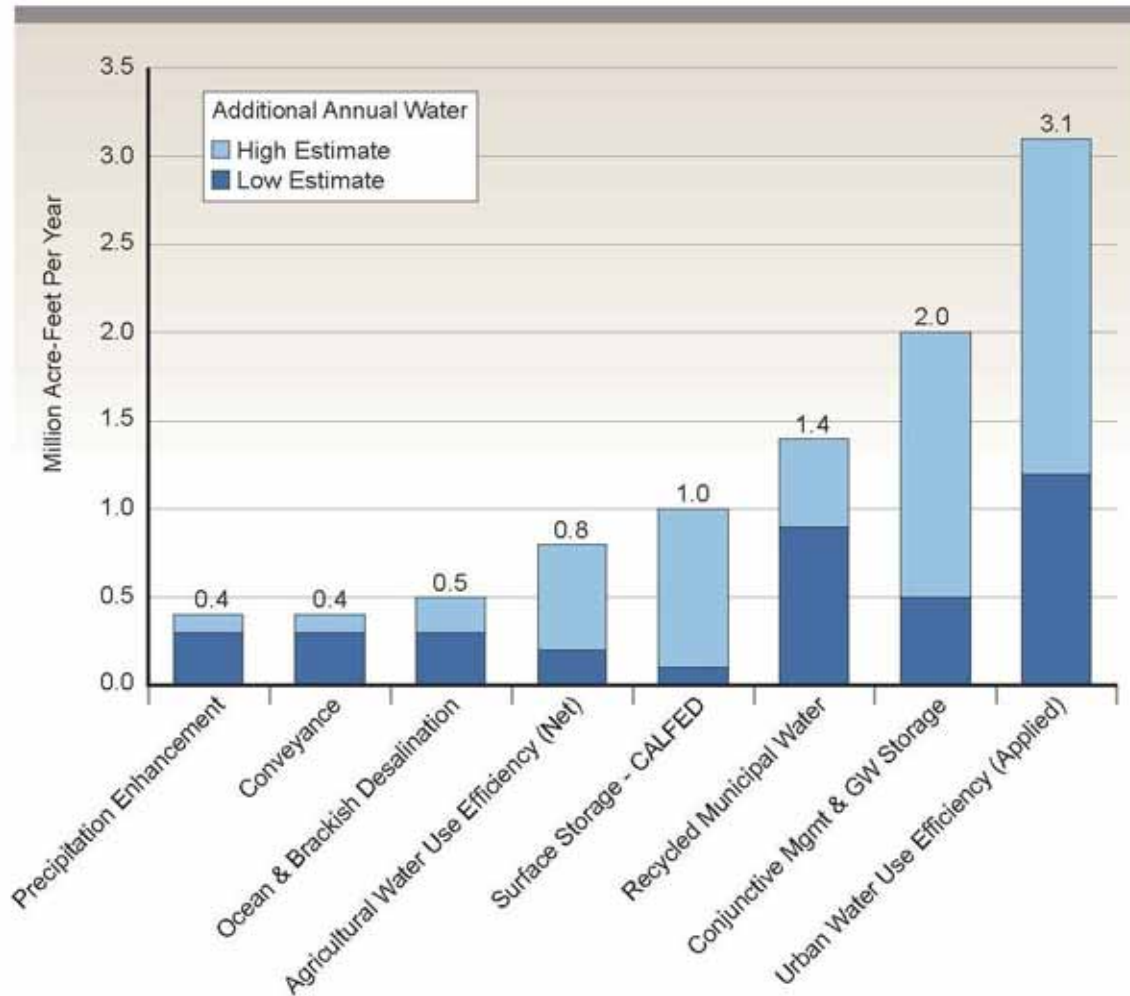
Natural branching channels in the Delta in 1873



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

Figure I-13
Statewide Upstream & Export
Diversions from the Delta Watershed





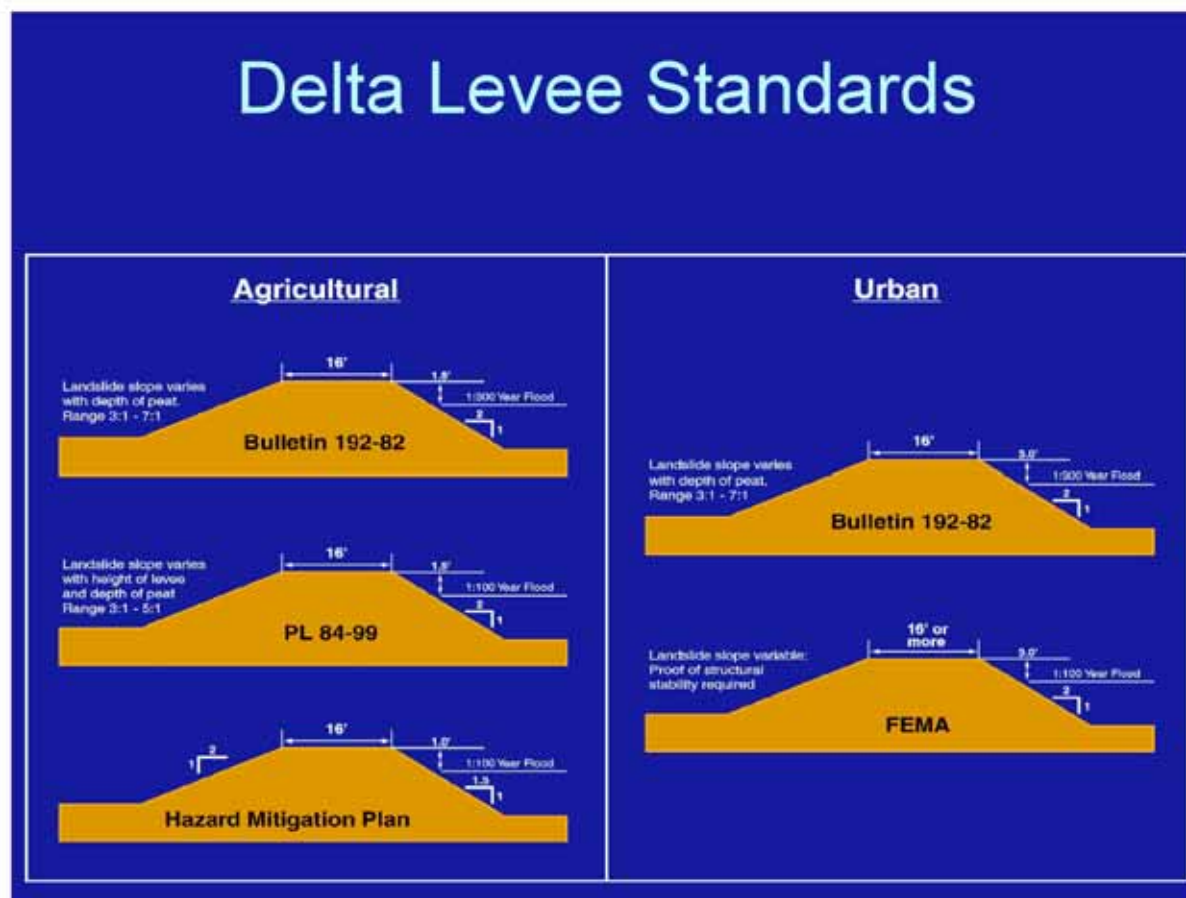
This graph shows the potential range of more water demand reduction and supply augmentation each year for eight resource management strategies. Low estimates are shown in the lower (dark blue) section of each bar. The water supply benefits of the resource management strategies are not additive. As presented here, urban water use efficiency includes reduction in both consumptive and nonconsumptive uses (or applied water), whereas agricultural water use efficiency only includes reduction in consumptive uses (or net water).

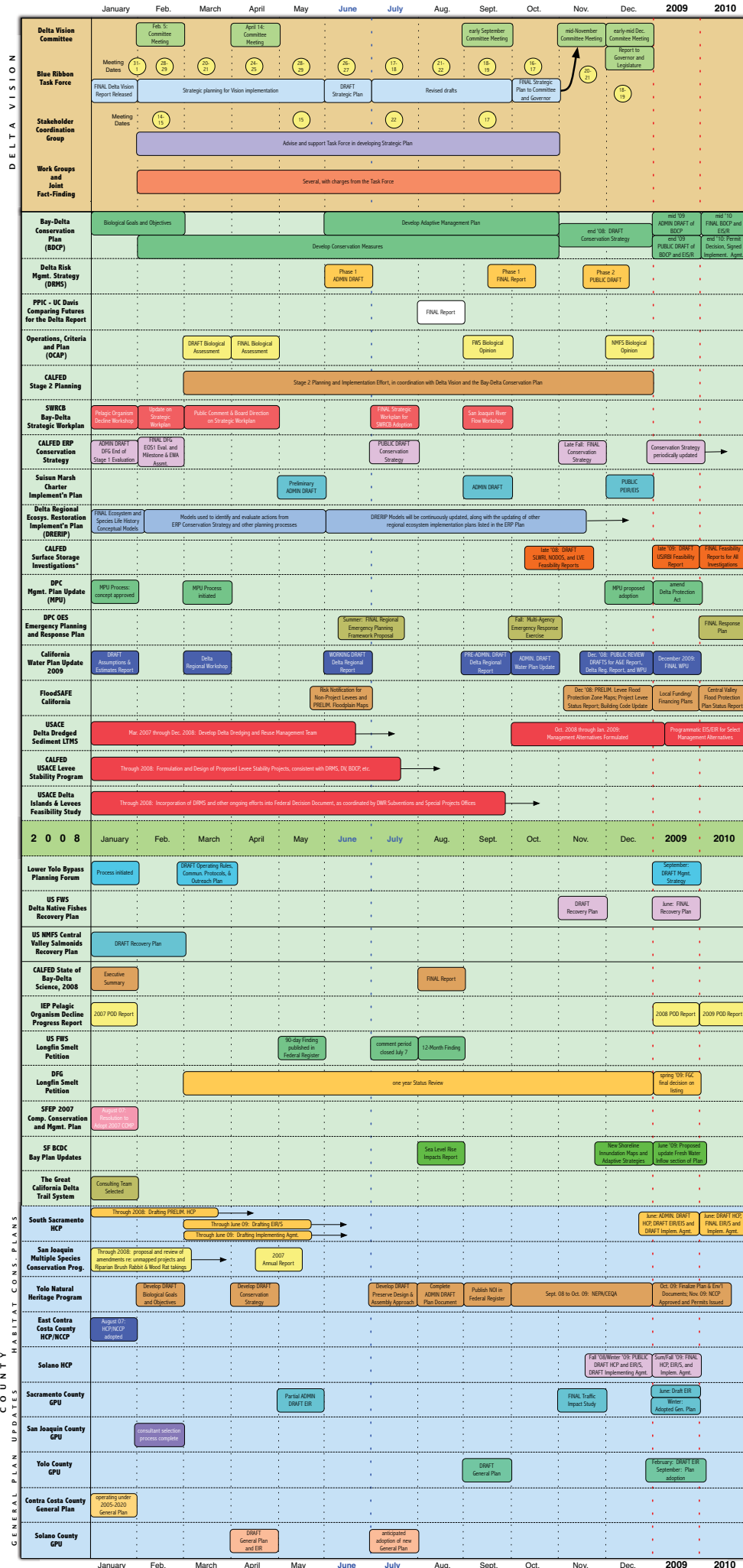
Source: California Department of Water Resources, California Water Plan Update, 2005, v.3.

Figure I-15
Delta Levee Failure



Figure 9. Cross-sections of typical levee designs in common use in the Delta.
Not exhaustive of existing or potential levee designs.





* 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/IR. NODGS = North-of-Delta Offstream Storage Investigation (aka Siles). USJRI = Upper San Joaquin River Basin Storage Investigation (aka Temperance Flats). SLWRI = Shasta Lake Water Resources Investigation. LVE = Los Vaqueros Reservoir Expansion.

Fourth Staff Draft Governance Structure

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.

Step 1: Abolish the California Bay-Delta Authority, and replace it with the California Delta Ecosystem and Water Council



CDEW PLAN

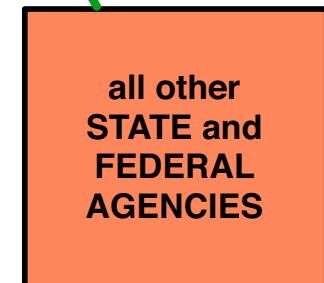
direct
implementing
role



enhanced
authority



existing
authority



Step 2: Create the California Delta Conservancy

Step 3: Adjust the authority of the Delta Protection Commission

Step 4: Retain existing authority: exercise to accomplish Plan

