BLUE RIBBON TASK FORCE

DELTA VISION

Our Vision for the California Delta

Cover Photos

The Red Bluff Diversion Dam on the Sacramento River is one of the larger diversions north of the California Delta.

Inserts, left to right:

A Great Blue heron takes wing over wetland habitat in the California Delta.

An aerial view of Discovery Bay during early 2006 storm flows. Houses built in flood-prone areas are at risk from rising sea levels that are a result of climate change.

A wind farm harnesses the Delta breeze while a wind surfer enjoys what's left of the day.

Photo credits: Discovery Bay by John Shelton; all other photographs by Department of Water Resources photographers.

Our Vision for the California Delta

Arnold Schwarzenegger
Governor of California

Governor's Delta Vision Blue Ribbon Task Force

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STATE OF CALIFORNIA
resources
AGENCY

ARNOLD SCHWARZENEGGER, Governor
MIKE CHRISMAN, Secretary

November 30, 2007

Governor Schwarzenegger
Delta Vision Committee Members
State of California

Dear Governor and Committee Members:

Executive Order S-17-06, directed us to "develop a durable vision for sustainable management of the Delta" with the goal of "...managing 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." The executive order calls for our vision to be completed by January 1, 2008 and a strategic plan by November 2008.

The time for action is now. The Delta is in crisis, and each day brings us closer to a major disaster. What the nation learned from New Orleans and Hurricane Katrina is the terrible price of waiting. Our twelve linked recommendations lay out a vision that offers hope for resolution of the vexing and difficult water and environmental problems of California.

We conclude that a comprehensive vision, together with integrated and linked actions, is the key to success. Our vision is comprehensive, addressing water, land use, environmental and institutional elements necessary to a desirable solution. Our recommendations are integrated, designed to work together as a whole to achieve success. Our recommendations are also linked, meant to be implemented together because they are tied to, and dependent upon, one another. The Delta cannot be "fixed" by any single action. Nor can water needs be met by any single action. No matter what policy choices are made, we Californians are compelled to change the ways we behave toward the environment and water. Delay in any of the important areas discussed in this vision will only make problems worse over the next decades.

Our recommendations make common sense but are bold. If they were not, they would be of little consequence. Your executive order asked us to present our 'independent' views and recommendations, and we have done so.

Twelve integrated and linked recommendations are at the heart of our vision:

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.

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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.

In the text that supports each recommendation, you will find discussion and concepts that generate intense debate. We consider that to be a sign we have achieved some of what you asked us to do. Fundamentally, California has to make difficult choices and we propose what those choices should be.

For those who rush to discuss Delta water conveyance as if no other issue is of importance, we caution that decisions about storage and conveyance flow from all twelve

recommendations in our Vision, and cannot be decided by themselves. To that end, we have recommended an assessment process focused on dual conveyance as the preferred direction, allowing an ultimate decision which fits into the other elements of this Vision. That assessment is discussed on pages 12-15.

Inevitably, we found ourselves identifying actions that must take place in the very near future. Accordingly, a list of Near-Term Actions is part of our vision. These focus on preparing for disasters in or around the Delta, protecting the Delta ecosystem and water supply system from urban encroachment, and starting work soon on short-term improvements to both the ecosystem and the water supply system. We urge you and the Legislature to incorporate these immediate steps in executive actions, upcoming bond measures or related legislation.

Our vision was developed over 14 days of public Task Force meetings since March. We had the benefit of excellent work by a 43 person Stakeholder Coordination Group which met publicly for 15 days. Likewise, we were informed by the advice of the Delta Science Advisors, appointed by your Administration, and by the efforts of your departments and agencies. Additional public comments helped shape our recommendations.

We turn next to developing a strategic plan to craft a comprehensive program for implementation. If we can help advance this vision for California and the Delta in other ways, please call upon us.

Phil Isenberg, Chair

Monica Florian

Richard M. Frank

Thomas McKernan

Sunne Wright McPeak

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The Delta is and will remain a powerful mixture of natural and human forces. ***We must learn to work with nature to achieve desired goals in the Delta.*** While human designs and engineering may support enhanced ecosystem function, as when human cultivation of tules and wet land crops helps rebuild subsided islands, or management of tidal action helps to recreate marshes, but much of the actual regeneration occurs by natural processes. The state must

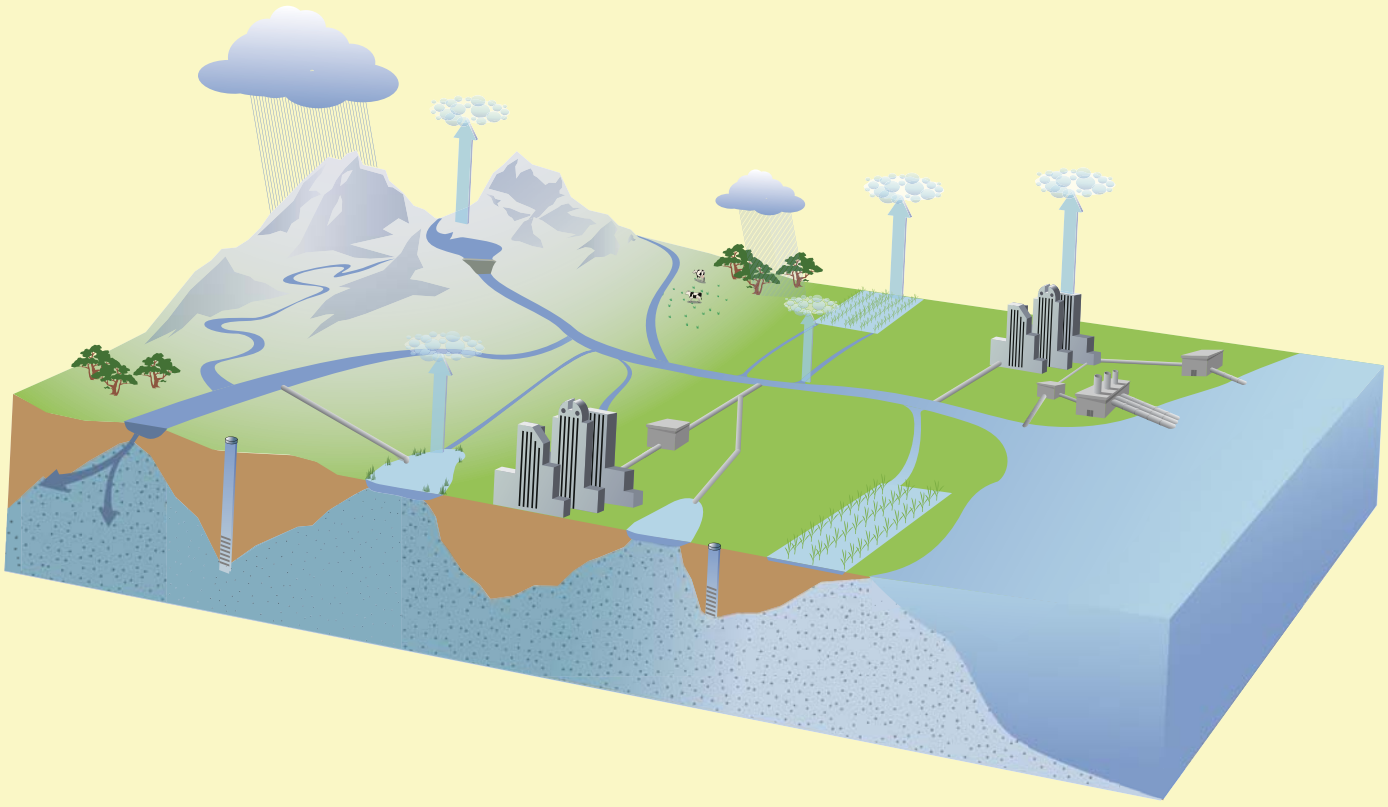
California Water Supplies and Uses (MAF)

	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

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

I. Executive Summary

Major changes in the Delta and in California's use of Delta resources are inevitable. Current patterns of use are unsustainable, and catastrophic events, such as an earthquake, could cause dramatic changes in minutes. The time for action is now. Changed policies and behaviors are needed statewide, in the Delta watershed, and in the Delta itself. As the stakes for California are very high and the resources required very large, the new policies and investments must be strategic and guided by a comprehensive vision. Our vision for the Delta and for California includes 12 integrated 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.

to achieving resiliency in water systems. There are many ways to achieve this resiliency. ***The state must encourage regional self sufficiency*** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

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.

The Delta is a regional, state, and national treasure. Its unique combination of estuary, water supply, recreation and tourism, aesthetics, lifestyle, and rural character make it a special place that we must recognize and protect.

The Delta is critically important to California but cannot be sustained as we know and use it today. Its unique character and its capacity to serve California are threatened by diversions of water, urbanization, flood and seismic risks, and invasive species.

For the past 150 years, Californians have viewed the Delta as a place to farm or fish and as a source of water for use elsewhere. We gave little thought to the environmental consequences of these actions. Levees built 100 years ago confined water to channels and transformed the Delta from marshland into dry "islands" of land available for human use. In the 837,594 acres in the Delta and Suisun Marsh, levees confine water to 10 percent of the total area, with agricultural uses in 557,896 acres. There are now 1,300 miles of levees in the Delta and Suisun Marsh—a longer stretch than the entire California coastline.

When levees were built, most celebrated the new farmland, and few thought of what might be lost. No regulatory policies made people consider the impacts of levees on the ecosystem. Similarly, many water diversions upstream and within the Delta were made before the public demanded environmental protection.

In later years, the channels built to create farmland were used to export water from the Delta. The federal Central Valley Project and the State Water Project, built from the 1940s through the early 1970s, changed the natural flow of water in the Delta and reversed the flow of the San Joaquin River at times.

Today more than half of Californians rely on water conveyed through the Delta for at least part of their water. Residents and businesses near the Delta and

San Francisco Bay area are most dependent on water from the Delta and its watershed. Urban areas south of the Tehachapi Mountains also use water exported from the Delta. Much of California's agriculture depends on water from the Delta watershed; one-sixth of all irrigated lands in the nation are in this watershed, including the southern San Joaquin Valley.

In addition to water diversions and exports, other factors have also changed the Delta or threaten large changes in the future. Invasive species have changed basic aquatic food production chains in the Delta. Ninety-five percent of living organisms in bottom samples are these non-native species.

More than 515,000 people lived in the Delta and Suisun Marsh in 2000, and nearby suburbs are moving into lands at the edges of the Delta needed for flood bypasses and habitat.

Many levees in the Delta were built with minimal engineering. As land dried out and was farmed, it subsided. Some islands are now more than 20 feet below sea level. Over the past 100 years, 160 levees have failed from floods or other events. Earthquakes could liquefy soils, destroy miles of levees, and threaten the many roads, water aqueducts, electricity lines, and gas pipelines that cross the Delta and are critical to the state's economy. The risk of earthquakes is growing as pressure builds in nearby faults.

Climate change is also bringing risks. It may increase the severity of winter storms and floods that could damage levees and threaten people and infrastructure. The sea level may rise 28 to 55 inches by 2100—more if large ice sheets melt.

New societal values and laws require changes. As the public has come to understand these problems, societal values have changed. Over the past 45 years, California's legislatures have passed many laws to protect the environment, water quality, and endangered species. California's governors have led regulatory efforts to ensure that water projects and diversions are judged on how they impact the environment. The federal government has followed suit.

Because the Delta is a critical natural resource and also the hub of a major part of California's water supply, harmful environmental impacts in the area are a matter of statewide concern. In summer 2007, the pumps of the State Water Project were stopped and the pumps of the federal Central Valley Project reduced to minimum operations for several days because of severe declines in Delta smelt.

California law provides for both environmental protection and the use of the state's water. The reasonable use and public trust principles of the California

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

Constitution provide a strong legal foundation for weighing water demands and uses.

In the past, much of the debate about water supply has focused on "conveyance" solutions—that is, on physical structures and on management that moves water around or through the Delta. This approach generally leaves other issues as either "mitigation" or afterthoughts to the conveyance proposal being discussed. Our vision is more holistic and broad ranging. In order to protect the Delta, we must address statewide water use, governance, population growth, public safety, public service infrastructure, long-term climate change, ecosystem threats within and outside the immediate Delta, seismic risk, and the character of the Delta as a place. From this perspective, decisions about conveyance are not the starting point but the final piece of the puzzle. Decisions about conveyance should flow from policies that address the full range of concerns. Solutions to all of these concerns must be carried out effectively for water to be exported reliably from the Delta.

This is the time to act. The difficult choices we face today will become even more difficult in the future. Procrastination will result in irretrievable losses: severe reductions in water uses and severe damage to the estuarine ecosystem.

Delta Vision was created to "develop a durable vision for sustainable management" of the Delta. Its objective is 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."[1]

A workable vision must include change in current policies and behaviors to achieve:

- **a comprehensive approach,**
- **clear priorities among uses,**
- **policies to address critical issues more effectively,**
- **science-based, adaptive actions, and**
- **a sound institutional foundation.**

[1] Executive Order S-17-06 is attached as Appendix 2. The Executive Order specifies a number of factors to be addressed which are incorporated into this vision and will be further developed during the strategic planning phase of Delta Vision in 2008.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

Improved levees, more groundwater and surface water storage, changed conveyance, and mitigation projects are needed and must occur. But they are insufficient by themselves to satisfy the intergenerational charge to Delta Vision. Achieving a durable vision for sustainable management of the Delta requires urgent and integrated action. To be more direct:

Inaction is only a continuation of the status quo in the Delta, which all who appeared before us have argued is totally unacceptable.

In re-envisioning the Delta, the state's water supply and the ecological resources of the Delta are both of paramount importance.

Significant Delta levee improvements must be made to protect urban populations, key islands needed to control salinity, key estuary components, water conveyance and reconfigured infrastructure corridors.

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It must be reconstituted to better function as an estuary which supports native species and recreational fishing and to be most resilient to future changes. ***More than half of Californians rely on water conveyed through the Delta for at least some of their water supplies*** and Delta watershed water is critical to much California agriculture, supplies threatened by harmful impacts of current practices on the environment, impaired

D E L T A

A couple enjoys an afternoon of fishing in the California Delta. The Delta hosts a variety of recreational opportunities including fishing, wildlife viewing, and boating.

II. Twelve Integrated and Linked Recommendations

The Delta is critically important to California but cannot be sustained as we know and use it today.

The Delta is a regional, state, and national treasure. Its unique combination of estuary, water supply, recreation and tourism, aesthetics, lifestyle, and rural character make it a special place that we must recognize and protect. Its unique character and its capacity to serve California are threatened by the harmful effects of diversions of water throughout its watershed, encroaching urbanization, flood and seismic risks, and invasive species.

This vision is our hoped-for future. It describes what that future will look like, how it will function, and what it will produce. It is something to which decision-makers should aspire. These are conditions we see as desirable if not ideal, challenging to achieve but not infeasible. The vision must result in a Delta that serves California for several generations. A vision is not a plan with targets, timetables, analysis of alternatives, or costs. Equally though, a vision must convey confidence that it can be achieved; that requires discussions of policies and investments sufficient to warrant acceptance of the vision.

Integrated, comprehensive action is needed; delaying or selecting some elements of this vision while ignoring others will lead to failure.

Our vision for the Delta and for California includes twelve integrated 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.** Both California's water supply and the ecological resources of the Delta are of paramount importance. They are co-equal: each is indispensable to California as a whole, and our actions must secure the future of both.

   Current uses of Delta water—including diversions upstream and within the Delta as well as exports—are a major barrier to a "durable vision for sustainable management of the Delta."

   But problems in the Delta can be solved only as part of a comprehensive effort to improve statewide water management and ecosystem management. Failure to protect the estuary could result in an inland salt sea or the collapse of an estuarine ecosystem with loss of protected and desired species. The consequences for statewide water supply would be unacceptable. The loss of a reliable supply of water from the Delta could

system functions continue to serve all Californians dependent on water from the Delta watershed. ***A durable vision for sustainable management of the Delta must be comprehensive.*** It must integrate the co-equal values of ecosystem and water supply, ensure that conservation and construction both take place, and develop effective systems of water

lead to substantial economic hardships because large fractions of the state's water supply must come from the Delta watershed. Some of this water must be exported from the Delta to other parts of the state.

As the vision is achieved, the two co-equal values of ecosystem function and water provision are deeply woven into the institutions and policies through which California has mobilized public resources to achieve that vision. This principle of equality does not mean that these two values will somehow be precisely balanced in every policy or management decision. Rather, it means that each is indispensable to the whole state and that each must be advanced in any decision. The sum of our actions must secure the future of both, ideally through choices which integrate the two values. This will result in change in current ways of using the Delta and its watershed.

As the vision is achieved, California's Delta remains a powerful mixture of natural and human forces. Humans learn to work with natural processes to attain desired goals in the Delta. Natural processes accomplish much of the regeneration necessary for the Delta and its ecosystem functions. Humans help. Human designs and engineering support enhanced ecosystem function. For example, human cultivation of tules and wetland crops helps to rebuild subsided islands, and management of tidal action helps to re-create marshes. To achieve the desired goals in the Delta, California must blend these natural and human energies into a productive new synthesis that restores and sustains ecological and human values equally.

2. **The California Delta is a unique and valued area, warranting recognition and special legal status from the State of California.** The Delta is a place of natural beauty, with historic towns, productive farming, and close-knit communities. The Delta is an integral part of the largest estuary on the West Coast of the Americas, connecting rivers originating in the Sierra Nevada to the Pacific Ocean. The Delta is also an indispensable part of the Pacific Flyway. These values should be preserved in any vision of a future Delta.

The Delta has been defined in state legislation and recognized by the federal government as part of the San Francisco Bay-Delta Estuary. The State of California should take steps to increase the visibility of the Delta as a unique and valued area. This would help create a statewide public identity for the Delta and encourage expanded tourism and recreational investment. For purposes of discussion of appropriate designation and protection, the name "The California Delta" will serve.

and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

Protecting California's Delta from encroaching urbanization is critical both to preserving its unique character and to ensuring adequate public safety and emergency response. Land use and governance considerations will be particularly important in that effort.

As the vision is achieved, California's Delta is recognized as a unique place that has value in its own right. Changes do occur in the Delta, but this vision helps support its transitions and preserve its core values.

3. **The Delta ecosystem must function as an integral part of a healthy estuary.** The goal for the Delta should be to create a more heterogeneous estuarine environment, including a diverse habitat mosaic, expanded areas of seasonal and tidal wetlands, effective connections between the estuary and the larger landscape and freshwater flows of the right temperatures at the right times. The physical geography of the Delta and patterns of food production, nutrient distribution, migration, water flow, and salinity must support ecosystem functions and processes characteristic of a productive estuary. At present, the Delta does not function robustly as an element of the estuary.

The Delta cannot be returned to a pristine state, and the Delta cannot be armored against all future changes in nature. It can and should be reconstituted to function more fully as an estuary, to better support native species and recreational fishing, and, importantly, to be resilient to future change in ways that achieve desired goals. As we take steps to improve habitats and establish more natural flood flows, we must design these policies carefully, constantly monitor and analyze results, and adjust policies as our knowledge increases. After any disaster, the Delta should be restored to support the two co-equal values of this vision of the Delta as a unique and valued area. That will not necessarily require restoration of all levees or other features of the Delta to their status before the disaster.

Efforts must also be made to reduce the number of invasive species and to monitor and manage the impacts of these species.

As the vision is achieved, the Delta functions more effectively as part of an estuary. The land forms and water areas of the Delta change, including subsidence reversal on selected islands, improved floodplains, and increased saltwater and freshwater marshes. Sufficient freshwater flows of the right temperature and timing are also critical in sustaining the estuary.

to achieving resiliency in water systems. There are many ways to achieve this resiliency. ***The state must encourage regional self sufficiency*** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

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.** It is possible to achieve our co-equal goals, but only if we Californians change our policies and our habits of water use. There is no unlimited supply of cheap water in California. Greater conservation, increased regional self-sufficiency in water supplies, more conjunctive uses, integrated water system management and demand management, and new technologies will all be essential. In addition, the State of California should encourage equitable access to higher quality water sources and seek to reduce conflict among water users for diversion from the highest water quality locations.

   As the vision is achieved, all areas of California have increased regional self-sufficiency, and water conservation is the ethic underlying water policy. Additional, alternative ways to move water among areas of the state are being developed. A revitalized ecosystem at critical times requires reduced diversions or changes in the patterns or timing of those diversions, upstream, within the Delta, and exported from the Delta. As the vision is achieved, water management practices are adapted to those changes.

   As the vision is achieved, water for human uses is more effectively separated from water for the ecosystem to achieve increased water system reliability and higher water quality for human uses and greater allocation of water for environmental purposes. The ecosystem cannot recover if it remains vulnerable to the upstream diversions and in-Delta water system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. As the vision is achieved, increased storage capacity and improved conveyance are in place to capture water at times that are least damaging to the environment and to efficiently move it to areas and times of need.

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.** The "reasonable use doctrine," a part of California's Constitution and water rights doctrine for nearly a century, requires that all uses of water in the state be reasonable. Under the doctrine, State of California water officials and the courts may limit a water rights holder who is wasting water, using water unreasonably, or employing an unreasonable method of use or of diversion.

The "public trust doctrine," a distinct but related legal principle, has even more venerable constitutional and judicial roots. It provides that certain natural resources including water, tide and submerged lands, the beds and banks of navigable rivers, and fish and wildlife resources are owned by the public and held in trust for present and future generations of Californians. State of California natural resource managers and legislators have an affirmative obligation under the public trust doctrine to act as trustees to oversee and manage those resources for the long-term benefit of the state and its citizens.

These principles have direct relevance to the Delta and the vision process. There are inevitable conflicts between protection of the ecosystem and provision of water for California. Application of the twin constitutional principles of reasonable use and public trust is the best way to determine how these competing values will be addressed.

As the vision is achieved, the institutions responsible for making decisions on use of California's water resources institutionalize reasonable use and public trust principles in their decisions. Water users are attentive to and make changes needed over time to address the reasonable use and public trust principles. These principles do not guarantee any specific decision about water uses but are the foundation for public policymaking and management decisions by water districts.

6. **The goals of conservation, efficiency, and sustainable use must drive California water policies.** We must start by requiring and investing in water use efficiency by all users throughout the state. The fastest ways to address the growing demands for water are to conserve and to increase the efficiency of the water supply system. These efforts can start almost immediately. Vigorous conservation efforts are essential as far as we can see into the future.

Some areas of California and some sectors of the California economy are already leaders in water use efficiency measures such as conservation and recycling. Because competition for California's limited water resources is growing, we must continue these efforts and be innovative in our pursuit of efficiency. Water use efficiency will continue to be a primary way that we meet increased demand.

In the future, we must broaden our definition of efficient water use to include other ways of getting the most utility out of our groundwater and surface water resources and water management systems:

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

- Increase levels of urban and agricultural water use efficiency;
- Increase recycled municipal water and expand its uses;
- Change water facility operations to improve efficiency;
- Facilitate environmentally, economically, and socially sound transfers to avoid regional shortages; and
- Reduce and eliminate groundwater overdraft.

As the vision is achieved, water use efficiency and conservation practices in California are among the best in the world, relying on a combination of building standards, best management practices, and pricing to ensure the most effective use of water resources.

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.** Water diversions upstream threaten the Delta ecosystem, as do Delta exports. Similarly, diversions for use within the Delta, largely for agriculture, affect the health of the Delta. Some diverted water is ultimately returned to the Delta, but almost invariably these return flows are of poor quality. Projected changes in snow pack because of climate change and increased diversions upstream of the Delta will also affect quantities, timing, and quality of water reaching the Delta.

As the vision is achieved, sufficient water is provided to support the Delta estuarine ecosystem and the policies affecting diversions throughout the Delta watershed protect needed flows. Water is diverted when and where it is least harmful to the environment.

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.** Existing Delta water conveyance systems are inadequate and must be improved. Similarly, existing groundwater and surface water storage capacity is inadequate and must be improved. Linking improvements in these two areas is critical to California's water future.

All Californians want their water supplies to be regular and reliable. But history shows us that there are no guarantees about when or how much rain and snow will fall. We build dams or fill underground water aquifers in wet years so we can use the water in dry years or at dry locations.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

Different users want water on different schedules. Urban users want water on a consistent schedule. Agricultural users want water when crops need it. Agencies responsible for species protection and ecosystem functions want flows that follow natural patterns of high flows, floods, and lower flows, and they want water when protected species need it. Different users also want water in different places. Current storage and conveyance systems often fail to meet competing expectations or even to allow accurate short-term predictions of water availability.

We need to sort through these diverse requirements and develop a system that is less reliant on the fragile nature of the Delta and on the legal constraints of meeting the needs of endangered species. Any construction or change in the operations of conveyance facilities in the Delta must be "coupled" to the construction and operations of storage facilities to ensure that the physical structures, timing, and operations of all facilities can be managed to meet all competing needs—for both environmental and economic uses. For example, new storage facilities for surface water or groundwater and on the floodplain should capture water when and where it would be least damaging to the environment.

One way to manage water exports is to create isolated facilities that take water around the Delta. Perhaps this would enhance the reliability of exports, create fewer problems for selected species, be less exposed to seismic risk, and result in higher water quality. But at this point, there is not sufficient specific information to guarantee these outcomes.

Similarly, the concept of a "dual" conveyance, joining an isolated facility to improved conveyance through the Delta, might increase reliability and capture more high-water flows, but again, not enough information is available at this point to ensure this.

Advocates of improving through-Delta conveyance argue that it will protect those who draw water from the Delta and will also create incentives to both water exporters and those who use water in the Delta to invest in maintaining levees and freshwater flows through the Delta. But specific information about water quality, costs, seismic risk, or meeting species protection laws is still incomplete.

The goals of reliable water supply and functioning ecosystems will be achieved by recognizing the interdependence of all elements of a sustainable Delta vision and making decisions about conveyance and storage within that larger perspective.

and conflict, to no one's benefit. This principle does not imply that these two values can somehow be held in balance in every policy or management decision at every scale. ***The water system and the ecosystem of the Delta are co-equal values that must be preserved on equal footing.*** California cannot sacrifice either the unique estuarine ecosystem of the Delta or the critical water supplies that power the state's dynamic economy.

Unless policymakers clearly call for a statewide perspective, a California Environmental Quality Act process on conveyance and storage projects will not examine crucial elements of these decisions that are identified in this vision. Analytic processes focused just on proposed projects are unlikely to reveal the full economic impacts or life cycle costs of water system improvements. They are also unlikely to address all Delta ecosystem problems. The analyses needed must go beyond conveyance, storage, and project mitigation and assess how the full set of policy choices from this vision will serve California for 70 to 100 years. In final policymaking, the specifics of conveyance and storage can be expected to be less than half of what is needed to meet the charge to the Delta Vision Blue Ribbon Task Force found in Executive Order S-17-06.

The Task Force recommends:

1. Immediate improvements to the existing through-Delta export system, including operations of all of the components, to ensure performance against the criteria listed below.

2. An assessment of a dual conveyance system as the preferred direction, focused on understanding the optimal combination of through-Delta and isolated facility improvements. The criteria to be considered should include at least the following performance standards:

    - Water supply reliability;
    - Seismic and flood durability;
    - Ecosystem health and resilience;
    - Water quality;
    - Projected schedule, cost and funding; and
    - Additional performance standards that may be identified by the Task Force.

3. A process should be launched to urgently assemble available information (including expert judgment where needed) on design features, cost, and performance of alternative conveyance options against specified criteria to allow selection of a preferred alternative by June 2008.

4. Steps 1-3 above should be linked to all of the recommendations of this vision.

5. The CALFED Bay-Delta Program is the appropriate entity to organize and lead the assessment described above.

Each alternative storage and conveyance system must be evaluated in regard to the full range of Delta resources and uses, including not just species listed under the state or federal endangered species acts but also estuary ecosystem function, water quality and water supply reliability goals, and impacts on the other factors identified in Executive Order S-17-06.

The Delta Vision Strategic Plan will provide much of the context for such evaluation. Benchmarks for assessing progress toward critical goals should also be developed, drawing on contributions from scientists, agency managers of programs, and knowledgeable citizens.

Because constructing any major improvements in storage and conveyance will take several years, current systems should be protected and improved. This will require strategic investments in the near-term while final design and assessment of longer-term alternatives are completed.

As the vision is achieved, improved conveyance and storage systems are linked to provide reliable water supplies of good quality with least negative impact on the environment and manageable risks of interruption. These systems are designed and managed from a broad state policy perspective in ways that also address the needs of the State Water Project and the Central Valley Project and in-Delta protected species.

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. Over the next few decades, billions of dollars will likely be spent to improve the estuary's ecosystem and levees, as well as California's water systems. Unless these investments are made in pursuit of clear goals, they will be of limited value. Investments in statewide water conservation or regional self-sufficiency efforts are essential, and of immediate utility; but beneficiaries must pay their appropriate share of these investments and also share in the risks and possible liabilities of action.

The Delta is and will remain a powerful mixture of natural and human forces. ***We must learn to work with nature to achieve desired goals in the Delta.*** While human designs and engineering may support enhanced ecosystem function, as when human cultivation of tules and wet land crops helps rebuild subsided islands, or management of tidal action helps to recreate marshes, but much of the actual regeneration occurs by natural processes. The state must

Significant Delta levee improvements must be made to protect urban populations, key islands needed to control salinity, water conveyance, and reconfigured infrastructure corridors. There will not be enough money to improve all levees. Funds should be allocated to match level of protection required. Levee design should focus on recoverability, not impenetrability. Over time, reliance on levees should decrease. New urban development should be restricted in flood-prone areas, including areas below projected sea level, all areas of deep floodplains, and areas necessary for flood bypasses and floodplains. Protecting, restoring, and enhancing floodplains that can reduce flood risks and reduce the strain on levees in the Delta should be a high priority.

As the vision is achieved, major investments consistent with this vision have been made in ecosystem revitalization, conveyance and storage, and selected levees. These investments are funded by an appropriate mix of beneficiary and state funds. Exposure to risks and possible liabilities are shared appropriately.

In addition, reliance on levees to protect Delta water, Delta lands, and humans is reduced; and policies are in place to match levee designs to land uses protected by those levees. Infrastructure, including roads, gas lines and water systems in the Delta rely on the 1,300 miles of levees that also protect all in-Delta water and land uses. Levees are critical to the Delta's future. Yet, existing levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of is-lands, cause dramatic changes in the ecosystem, and halt all water exports from the Delta for years. Recognizing these possibilities does not mean abandoning the levees that define the Delta. It does mean that policies to reverse subsidence should be pursued, that decisions about infrastructure should seek to reduce reliance on levees, and that not all levees should provide equal levels of protection. As the vision is achieved, levees protecting urban areas are designed to provide more protection than levees protecting agricultural land or recreational land.

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. Current governance systems are inadequate to the challenge at hand

and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

and must be changed. The new governance system needs a single entity with a statewide perspective to ensure integrated action to implement this vision. This single entity would have the capacity to apply the constitutional principles of reasonable use and public trust to ensure the co-equal priorities of protecting and improving the Delta ecosystem while also making a reasonable amount of water available for human use. It should also be an advocate and steward of this vision within the state government and to the people of California.

The single entity must:

a. Have sufficient authority, including authority over ecosystem improvements and water diversions and exports;

b. Have sufficient financing to sustain activities over decades, including ability to impose fees on those who use water resources from the Delta watershed or otherwise impact the Delta ecosystem;

c. Have clear, effective working relationships with federal and local agencies and officials;

d. Incorporate contributions of stakeholders, probably developed through structured collaborative processes; and

e. Be supported with state and federal policies that align the incentives and costs that individuals, businesses, and others face with a sound long-term vision for the Delta.

In addition to this single entity, the new government system will need other structures to address critical issues or to provide arenas for stakeholders and experts to participate in decision-making processes. For example, a separate body that includes a substantial number of relevant local government officials must be vested with the responsibility to ensure that land-use decisions about specific parcels within the Delta planning area are consistent with the vision and be given the responsibility to implement the policies of the single governance entity. In addition, an entity that helps to mobilize public involvement and provides incentives and support for private interests to support this vision should also play a key role in long-term Delta stewardship.

This governance system must be supported by robust programs of science focused on improving understanding of the Delta and of the effects of policies and programs.

to achieving resiliency in water systems. There are many ways to achieve this resiliency. ***The state must encourage regional self sufficiency*** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

As the vision is achieved, important decisions about governance of the Delta, especially integrating ecosystem function with reliable water supply, and in support of the Delta as a unique and valued area, are made effectively in a timely fashion and are well-accepted. Structures and processes are in place to ensure development and use of science needed to support effective decision-making. Other structures and processes provide for effective contributions by stakeholders to decisions. Sufficient funding is available on a consistent basis to support this governance system.

11. **Discouraging inappropriate urbanization of the Delta is critical to both preserve the Delta's unique character and to ensure adequate public safety.** The region's landscape should continue to be dominated by agriculture, habitat, and recreation with mutually beneficial mixtures of these wherever possible.

Land-use choices should both protect human residents from disaster and preserve management flexibility for the Delta over the long term. Housing development should be discouraged in flood-prone areas, including areas below sea level and in deep floodplains. Protection of human life is of paramount importance, and the Delta floodplains are a fundamentally unsafe place for housing even with new investments in levees.

It is irresponsible to make land-use decisions that permit and encourage construction of significant numbers of new residences in the Delta in the face of the flood hazards that unquestionably exist there. Current engineering knowledge indicates that those hazards cannot be overcome, and the safety of such new residents guaranteed, without the expenditure of massive funds for flood protection. Yet, developers and homeowners are unable or unwilling to bear these costs, and the public should not be required to subsidize them. The impacts of climate change—especially rising sea level and increased precipitation runoff patterns—will only exacerbate future threats to public safety associated with such development in the Delta.

As the vision is achieved, Delta land uses will be compatible rather than in conflict. Decision-makers responsible for the Delta will make land-use decisions that avoid inappropriate urbanization of the Delta, in deference to other land uses that are compatible with the vision's overarching, dual priorities of ecosystem restoration and reliable water supply.

12. **Institutions and policies for the Delta should be designed for resiliency and adaptation.** There are no simple fixes for the Delta. There are significant uncertainties about both important natural processes and the effectiveness of human engineering and policies. Over the coming decades, California's Delta will be subject to powerful external sources of change. Some of these sources are natural, like floods or earthquakes. Humans contribute to other sources of change, like population growth and urban development, introduction of invasive species, or climate change. These external forces of change mean the physical configuration of the Delta as it exists today is not stable. Policies seeking to maintain a static Delta against these changes will fail.

The Delta will change. Achieving sustainable management of the Delta means designing physical and institutional forms that will allow the system as a whole–and the critical economic and ecological functions it provides–to survive what could otherwise be catastrophic shocks.

These factors argue for designing for resilience—the capacity to "bend without breaking" and to thereby reduce odds of catastrophic failure, or to allow easier, cheaper repair after failure—and for ensuring the capacity for adaptation. Robust science and public understanding will be critical to support effective policymaking and operational management required for adaptation.

As the vision is achieved, California has developed institutions and policies designed for resiliency, in both the Delta and the California water system as a whole. Resiliency means the ability of a system to adjust to disturbance without changing into a totally different system controlled by a different set of processes. A resilient ecosystem can withstand disturbances and rebuild itself in ways that are valuable to society. Resiliency for the water system means a statewide water system that has the ability to withstand disturbances in the environment and therefore provide greater supply reliability to meet changing demands. Resiliency for both the ecosystem and the water system also means that people need to reduce their dependence on water from any single source, including the Delta.

Fragile systems are those that rely on a few brittle parts, an accurate description of the Delta ecosystem and the state water system today. Resilient systems rely on multiple mutually supporting parts, functional back-ups, and the capacity for gradual (not catastrophic) change in response to new conditions. Resiliency is necessary for the future. The Delta covers a large area with many different types of land forms and

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

water channels. This diversity is an asset in designing for resiliency because it distributes functions and risks throughout the area.

As the vision is achieved, California develops more capacity to anticipate and respond to powerful external sources of change. Some of these sources are natural, like floods or earthquakes. Humans contribute to other sources of change, like urban growth or climate change. These external sources of change mean the physical configuration of the Delta as it exists today is not stable. The changes will happen, and achieving sustainable management of the Delta means designing physical and institutional forms that allow the system as a whole—and the critical economic and ecological functions it provides—to survive what could otherwise be catastrophic shocks. Designs for seeking a static Delta against these changes will not achieve sustainable management.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

III. Selected Polices to Achieve the Vision

A successful vision states important values, provides a common understanding of the desired goals, and motivates broad commitment and action. This vision recommends comprehensive action including 12 integrated and linked recommendations.

But a vision does not become reality by itself. Achieving a vision requires contributions from everyone—governments, individuals, businesses, and non-profit organizations. Achieving a vision presents several challenges. One challenge is recommending public-policy strategies and identifying the institutions that can carry them out. Because the Delta is central to California's natural hydrology and water system, any comprehensive vision to secure its future must include measures that take place outside of its legal boundaries. Indeed, in one way or another, much of the State of California is intimately connected to the Delta.

Four important policy areas are examined here:

a. The California Delta

b. Ecosystem

c. Water supply

d. Delta levees and floodplains

More development in these and other areas will occur in the strategic planning phase in 2008. In each of the following discussions, important features of the policy area precede recommendations.

a. The California Delta as a unique place

Statement: The California Delta deserves state recognition and legal status as a special area. This special-area designation should help inspire and guide investments in ecosystem regeneration, land acquisition or protection, and the recreation, agricultural, and tourism economy.

Though little recognized by many Californians, the Delta is a region of unique and irreplaceable cultural value. It is a place where Native Americans lived and harvested food, where river travelers have long passed between the Central Valley and the ocean, where America's only rural "Chinatown" was built and still stands, and where industrious farmers invented entirely new tools to work the unique Delta soils. In more recent times, it has been a recreational haven to millions of Californians, offering valued boating, fishing, hunting, and bird-watching—or simply the chance to partake of a slower pace of life.

It must be reconstituted to better function as an estuary which supports native species and recreational fishing and to be most resilient to future changes. ***More than half of Californians rely on water conveyed through the Delta for at least some of their water supplies*** and Delta watershed water is critical to much California agriculture, supplies threatened by harmful impacts of current practices on the environment, impaired

Its agricultural lifestyle and rural quality contrast sharply with the intense urbanism of the Bay Area, Stockton, and Sacramento.

From wine grapes and pears to rice, corn, and tomatoes, the Delta grows more than 90 different crops, producing more than $650 million annually in farm sales for the California and Delta economies. The combination of fertile soils, a marine-influenced climate, proximity to market, and the accumulated experience with this unique farm region of generations of farming families makes the Delta a key and valuable part of California's famed diverse and rich agricultural bounty.

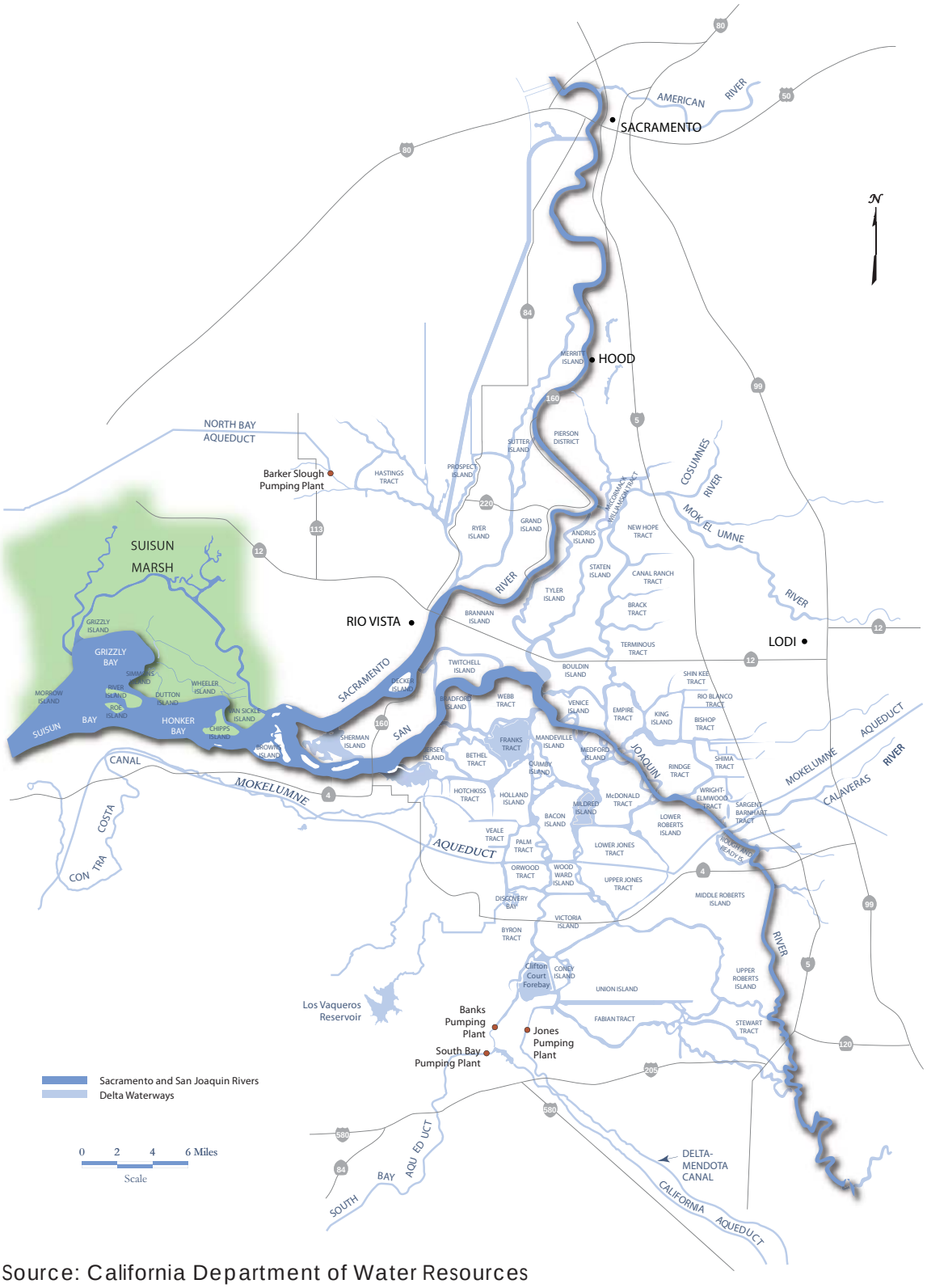
The Delta will change, but its core values as a unique place must be preserved and enhanced in the future. With millions more people arriving in northern California over the coming decades, the Delta's role as a recreational retreat will become even more valuable. Indeed, with its rich mixture of habitats, farmlands, open spaces, watercourses, fisheries, and historic towns, the Delta could become a compelling new kind of tourist destination that mixes ecosystem restoration, outdoor recreation, and an active local economy. In addition, the Delta is home to several key infrastructure systems of statewide importance, including highways, railroads, aqueducts, and electricity and natural gas lines, which cannot be allowed to fail for long periods of time.

For all these reasons, there must be increased recognition, increased status, and increased protection of the Delta as a place, not just as a water supply or a species habitat. The goals of regenerating the Delta and securing critical infrastructure should not diminish the cultural and recreational value of the Delta. On the contrary, these should be mutually supporting. New investments to meet ecosystem and water supply objectives can complement efforts to enhance the Delta's recreational, tourism, and agricultural economies and should not diminish disaster protection for critical infrastructure.

The Delta's land use pattern must enhance both the region's unique values and the overall resilience of the system. To preserve the Delta's place values, the region's landscape should continue to be dominated by agriculture, wildlife habitat, and recreation, with mutually beneficial mixtures of these wherever possible. Specialized forms of agriculture that are particularly well suited to the Delta must be encouraged, such as subsidence-reversing crops, carbon-sequestering crops, and wildlife-friendly farming practices.

The Delta's recreation and tourism economies also should be the subject of active investment and promotion by private, non-profit, and governmental entities over the coming decades. The Sacramento River legacy towns, the agricultural areas, and the wildlife habitats that attract visitors today should

Figure 1. Map of the Sacramento-San Joaquin Delta and Suisun Marsh



Source: California Department of Water Resources

system functions continue to serve all Californians dependent on water from the Delta watershed. ***A durable vision for sustainable management of the Delta must be comprehensive.*** It must integrate the co-equal values of ecosystem and water supply, ensure that conservation and construction both take place, and develop effective systems of water

be allowed to change in ways that are consistent with the Delta Vision. New enterprises that present the Delta's values to the larger public should be allowed and encouraged. For example, the mutually beneficial co-existence of habitat restoration, recreation, agriculture, and public education that takes place as part of the collaboratively managed Yolo Bypass Wildlife Area could be replicated elsewhere in the Delta.

To enhance the resilience of the system, however, land-use choices should both protect human residents of all economic levels from disaster and preserve management flexibility for the Delta over the long term. Housing development must be kept out of all flood-prone areas, including all areas below current or projected sea level and all areas in deep floodplains, whether within or outside the existing Delta primary zone. Protection of human life is of supreme importance, and Delta floodplains are a fundamentally unsafe place for housing development even with new investments in levees.

Equally importantly, new housing development cannot be allowed to compromise the flood protection for existing Delta residents and businesses. New housing developments in floodplains constrain flood conveyance capacity and can increase the threat of levee failure in surrounding areas and downstream. Areas suitable for the creation of new flood bypasses to protect existing Delta residents and services must also be kept free of housing developments. Recent court decisions on liability for levee failure have heightened the urgency of these issues for the state government.

Finally, land-use policy must recognize that many areas at the Delta periphery that are under the greatest pressure for urbanization are also indispensable to the long-term management of the ecosystem and water supply. As sea level rises, the geographical areas suitable for tidal wetlands regeneration will shift accordingly—but only if they have not been paved over or cut off by levees. Floodplain habitats on all rivers entering the Delta can provide crucial rearing and migration habitat for key fish species, but these functions would be greatly diminished by the presence of housing developments. Lastly, the most logical rights-of-way for any isolated conveyance facilities also pass through areas that are under significant urbanization pressure.

Even the expectation of future development will make preservation of these key Delta functions dramatically harder. Habitat restoration and water conveyance routing require land acquisition that will be far more expensive if land prices are determined by speculation on future development. As a result, efforts should be made to prevent a rush to establish development entitlements before appropriate Delta protections are in place.

and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

Given the fragmented nature of institutions in the Delta today, this coordination will be best achieved by a new planning area that encompasses (but does not replace) the existing boundaries of the Delta Protection Commission. The geographical boundaries of this planning area should extend beyond the existing legal Delta to incorporate adjacent areas where land use choices will have a substantial impact on the fate of the legal Delta. This boundary also should be set in accordance with a relevant, coherent, and defensible ecological or hydrological criterion, such as a future high-tide line or elevation line.

Much of the Delta consists of lands subject to the ebb and flow of the tide. These lands are subject to what is commonly known as the public trust, under which the State of California holds them subject to a duty to see that their use preserves the people's interest in such trust purposes as commerce, navigation, fisheries, and ecological study. Generally speaking, the State of California's interest in the tidelands extends to the mean high-tide mark (as opposed to the public trust interest in freshwater, navigable waterways, which extends to the ordinary high water mark).

As sea levels rise due to global climate change, the mean high-tide mark will move farther up land in and around the Delta. In planning for the future of the Delta and of immediately surrounding lands that may be subject to tidal influence, state and local agencies have a duty to avoid whenever feasible activities that would injure trust purposes and to mitigate them if they are unavoidable. Figure 2, "Area of Potential Inundation from a One Meter Rise in Sea Level," was prepared by the United States Geological Survey. One meter of sea level rise—approximately the mid point of the range expected by 2100 according to the Delta Vision Science Advisors—will inundate an additional 209,920 acres.

The proposed planning area must clearly designate the Delta as a special area and should help inspire and guide investments in ecosystem regeneration, land acquisition or protection, and the recreation, agricultural, and tourism economy. The investments themselves, however, should be made by a variety of actors, including private entrepreneurs, non-profit organizations, and government at all levels. This planning area must also ensure that all such investments conform with the overall regional management goals of ecosystem regeneration, water supply reliability and quality, human safety, and preservation of the Delta's unique value as a place.

b. Policies to achieve a more resilient estuarine ecosystem

Statement: Estuaries are variable environments by nature, and therefore the Delta should incorporate enough of that variability to achieve the

to achieving resiliency in water systems. There are many ways to achieve this resiliency. **The state must encourage regional self sufficiency** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

desired functions and processes and support desired species. This will be especially true in the longer term, as climate change makes it more and more difficult to sustain relatively constant conditions. The entire web of estuarine relationships must be re-woven and sustained as a resilient ecosystem.

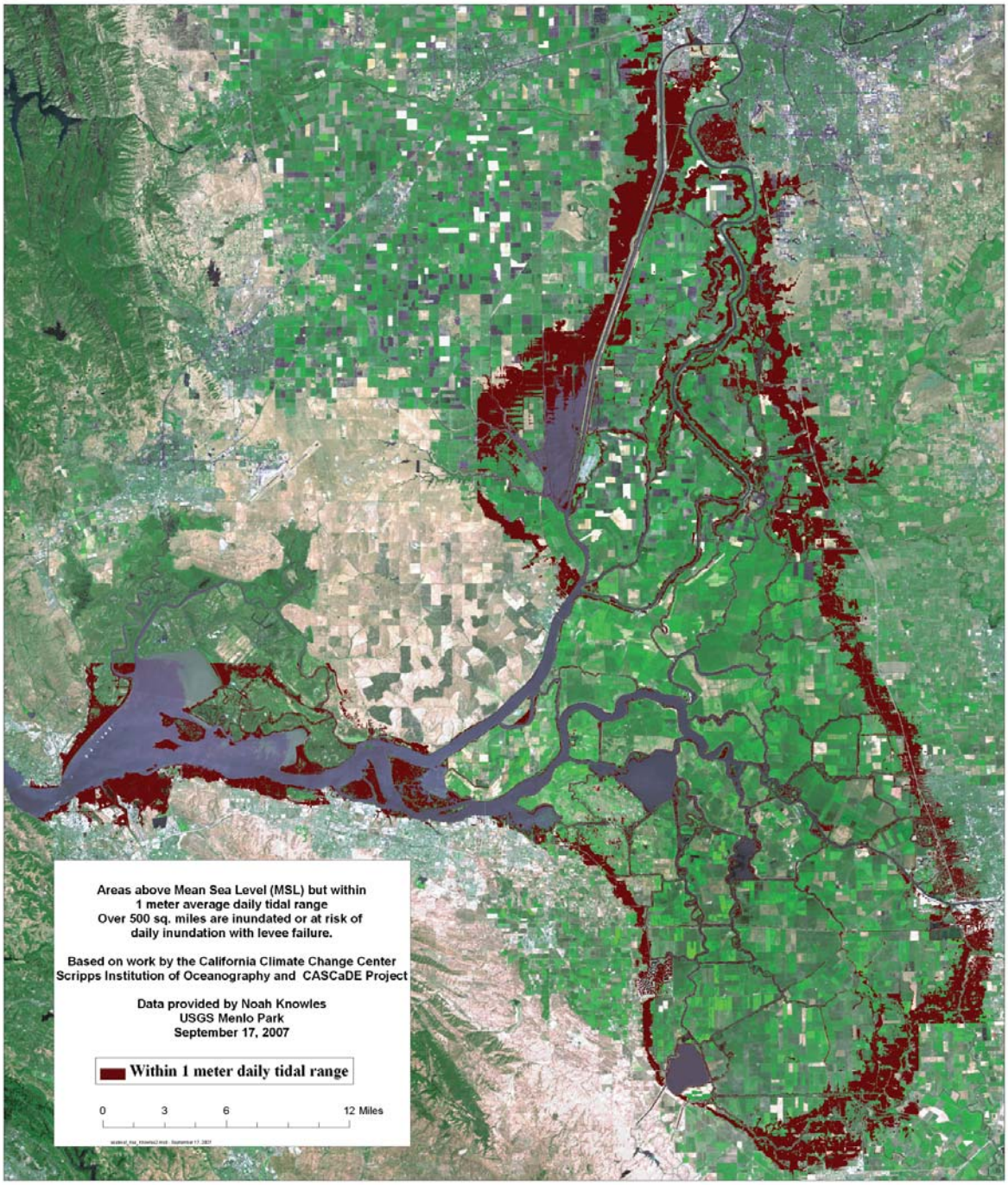
The Delta is an integral part of the largest estuary on the West Coast of the Americas. It connects rivers originating in the Sierra Nevada to San Francisco Bay and the Pacific Ocean and productive upland with tidal marsh. Estuaries are subject to tidal influence, mixing salt, brackish, and fresh water at different locations according to seasonal river flows and tides. This estuarine environment once teemed with fish and wildlife and is still essential to hundreds of species from crabs to mammals and fungi to grasses. Some of these are unique to the region, such as the delta smelt and the Antioch dunes evening primrose. The Delta is also an indispensable part of the Pacific Flyway, an intercontinental migration corridor for hundreds of bird species. The Delta historically has supported lucrative commercial and sport fisheries of both native and non-native fish.

In developing policies to revitalize the Delta ecosystem, many ecological roles must be kept in mind. The Delta, the flyway, and the fisheries all provide great value to the State of California, both as tangible economic assets and as a trust that we must steward for future generations. Delta lands are also important elements of the Delta ecosystem and provide large value to the State of California. Delta levees are vital to protecting water as much as islands and infrastructure and make critical contributions to the successful functioning of the Delta.

The Delta's ecosystem must be regenerated so that it functions more effectively as an integral part of the San Francisco Bay estuary, combining tidal and river flow patterns within appropriate physical habitat types characteristic of the historical Delta. The Delta must also contain thriving terrestrial habitats and sport and commercial fisheries that have been important to northern California's culture and economy for decades. To meet these objectives, the different areas of the Delta will be managed differently.

The Delta ecosystem cannot be returned to its pre-European contact condition, when it was a vast sea-level tidal marsh. It is also facing powerful sources of change including rising sea levels and water temperatures and the prospect of sudden changes in habitat structure caused by levee failures. Given these facts, a desired Delta ecosystem should not be defined in terms of a static "end state," but rather in terms of the beneficial functions and uses that it provides and the resilience of those functions and uses to external disturbances.

Figure 2. Area of Potential Inundation from a One Meter Rise in Sea Level



Source: U.S. Geological Survey

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

When CALFED Bay-Delta Program began, the scientific conceptualization of how the Delta works was derived mainly from the long history of research on East Coast estuaries. CALFED greatly increased the research on the upper San Francisco Bay-Delta Estuary, particularly the Delta, gathering new data and synthesizing information from 30 years of monitoring conducted by the Interagency Ecological Program, U.S. Geological Survey, and other agencies. The result has been a greatly improved understanding of the Delta as part of a unique ecosystem and a much firmer foundation for planning effective ecological restoration. As we enter a new era of water and environmental management in the Delta—an era that will be characterized by important changes in hydrology, climate, and land use—it is imperative that we strengthen the science infrastructure in support of the new vision for the Delta.

Applied science, particularly science supported through the CALFED Bay-Delta Program, provided the foundation of understanding that identified the need for a new vision. One of the most important results of research focused on the Delta was a clear recognition that the Delta is threatened by impending change, that the Delta of today is not sustainable. Despite our growing understanding of the Delta and California's water supply, the future remains uncertain. Adaptive management provides an effective tool for addressing future uncertainty and is heavily dependent on a solid infrastructure for science. Focused Delta science as part of a system of adaptive management will be an essential component of the new vision.

As an estuary, the important functions of the Delta are the patterns of food production, nutrient distribution, water flow, migration, salinity, water temperature, and more. The entire web of estuarine relationships must be rewoven and sustained. Estuaries are variable environments by nature, and therefore the Delta should incorporate enough of that variability to achieve the desired functions and processes. This will be especially true in the longer term, as climate change makes it more and more difficult to sustain relatively constant conditions. Figure 3 shows the positive results from functioning habitats.

In any ecosystem, ecological functions are a product of a given physical habitat structure and the ecological and physical processes that occur there, with additional influence from external stressors, such as pollution or powerful water pumping that alters currents.

All of these elements are of critical importance in the Delta, and all are limiting the success of desirable species in one way or another. For the Delta as a whole, a resilient, regenerated ecosystem will contain:

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

Figure 3. Better Habitat Equals Greater Growth

Juvenile salmon that grow up in a floodplain (right) grow faster and larger than those from the main channel (left).

Photo by Jeff Opperman; from Cosumnes River field study by Carson Jeffres.

Physical Habitat

1. Seasonal and inter-annual patterns of freshwater flow into and through the Delta that will re-establish variable water conditions and floodplain inundation for the benefit of native species;
2. Channel configurations that are like tentacles and contribute to variable residence time and greater habitat complexity;
3. Tidal access to low-lying marginal lands to encourage tidal freshwater and saltwater marsh development;
4. Patterns of sediment transport, deposition, and erosion that maintain appropriate levels of turbidity as well as intertidal and shallow sub-tidal land forms;
5. Broad corridors of natural and semi-natural habitats connecting marsh to extensive upland;

and conflict, to no one's benefit. This principle does not imply that these two values can somehow be held in balance in every policy or management decision at every scale. ***The water system and the ecosystem of the Delta are co-equal values that must be preserved on equal footing.*** California cannot sacrifice either the unique estuarine ecosystem of the Delta or the critical water supplies that power the state's dynamic economy.

6. Geometry and topography that allows all life forms expected in a delta-estuary system;
7. Marginal land reserves that will allow upslope migration of wetland types in response to sea level rise.

Ecological Process

1. Enhanced processes of food productivity and delivery to valued components of the ecosystem;
2. Restoration and expansion of ecosystems on which rare and threatened species depend;
3. Enhanced processes that strengthen competitive ability of native species.

Stressors

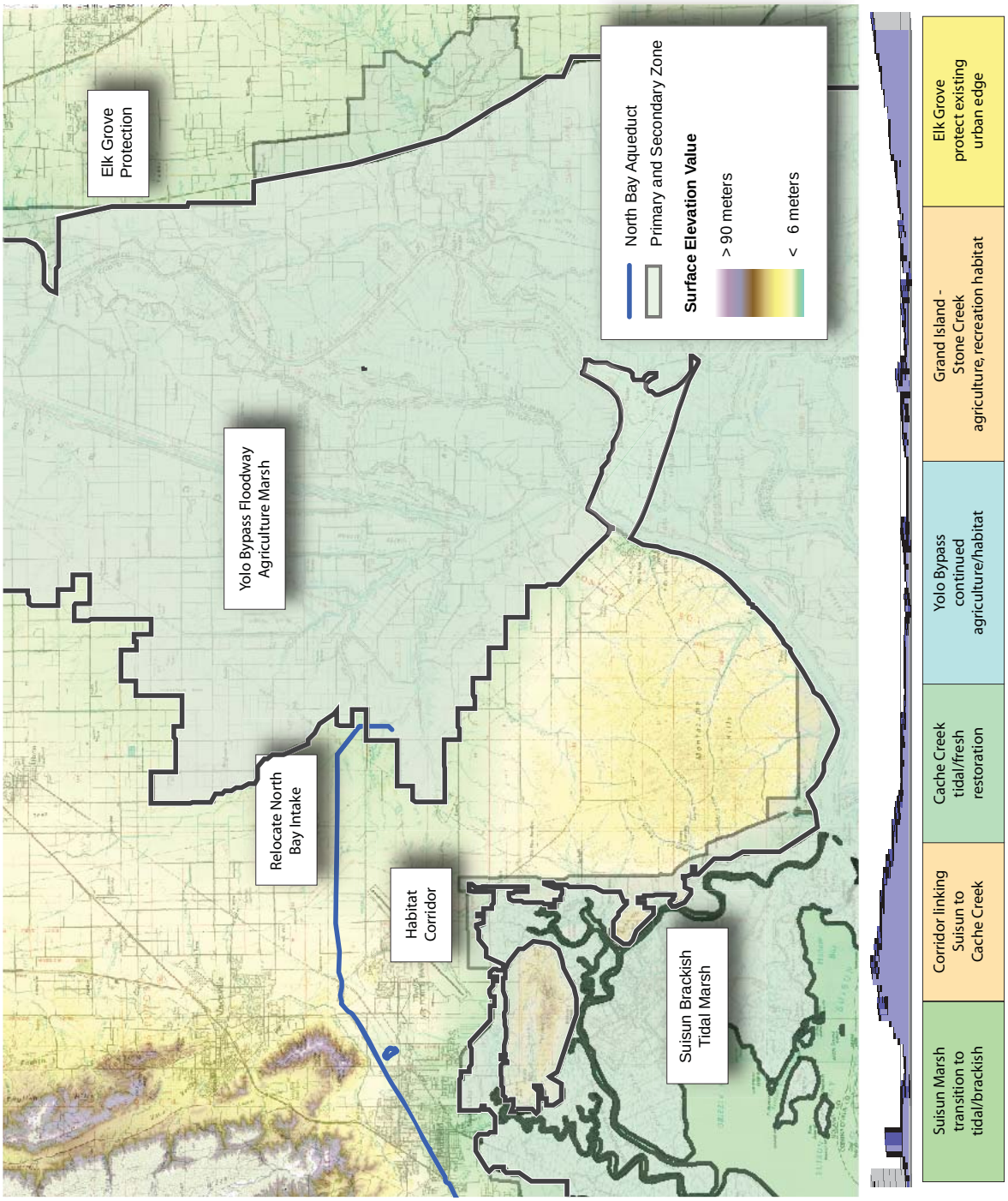
1. Reduced impact of chemical stressors of all types on Delta species and ecosystems;
2. Reduced impact of established non-native species on native species;
3. Reduced opportunity for invasion of new non-native species;
4. Reduced or eliminated entrainment of desired species and food organisms into water intakes;
5. Reduced or eliminated effects of export pumping on flow patterns in the Delta.

Figure 4 suggests how actions at the northern edges of the Delta could enhance estuarine function. This is not a complete list, nor specific recommendations; it illustrates how varied natural elevations in the area can be exploited to improve estuarine functions.

c. Policies to achieve a more resilient water system for California

Statement: Water systems and their management must be adaptive, sensitive to environmental impacts, supportive of the economy, and able to respond quickly to major disasters.

Figure 4. Illustration of Improving Estuarine Ecosystem Functions



Source: Robert Twiss, University of California at Berkeley

The Delta is and will remain a powerful mixture of natural and human forces. ***We must learn to work with nature to achieve desired goals in the Delta.*** While human designs and engineering may support enhanced ecosystem function, as when human cultivation of tules and wet land crops helps rebuild subsided islands, or management of tidal action helps to recreate marshes, but much of the actual regeneration occurs by natural processes. The state must

Water is limited in California

As has been noted, water conservation throughout California is essential to accommodate trends in long-term population growth, climate change, and disaster risk. Water conservation strategies must begin by recognizing that not all uses of water are equally valuable. Water is a public resource, subject to the public trust, to be managed appropriately for identifiable public benefit, and to be preserved for future generations. The sustenance of human life, the conservation of ecosystems, and the supply of critical economic activities must be explicitly recognized as the highest uses of California's water in all local water management decisions.

The principle of resilience also applies broadly to the State of California's water system. The Delta's watershed is 27 percent of the land area of California and receives 36 percent of the precipitation for the state. Large populations outside of the watershed are serviced by exported Delta water. As shown in Figure 5, precipitation in California has changed little over 116 years, though climate change projections suggest more rainfall than snow, reduced snow pack, and more severe storms in the future. This telling fact is often lost in our discussion over state water policy.

The amounts and characteristics of the water flowing through the Delta are profoundly shaped by the land uses, technologies, and human behaviors that occur in both of these areas. Figure 6 shows the Delta watershed boundary on a map of California.

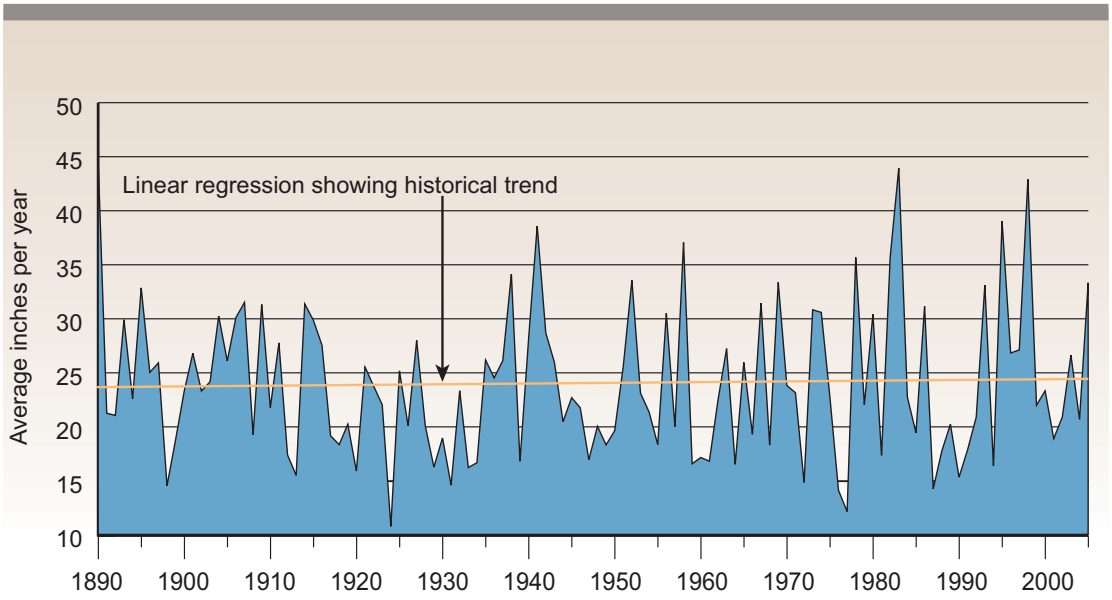
Because of California's mediterranean climate, the key challenge for the statewide water system has been to shift water from wet years, wet seasons, and wet locations to drier times and places. California's major supply of water is from rain and snow that falls north and east of the Delta (with a relatively modest amount imported from other states). But the major demand for water is west and south of the Delta.

The Delta is an important, but not dominant, part of the California's water supply. A relatively small proportion of total state water from rain, snow or inflow from other states flows into the Delta—15 percent in a wet year, 13 percent in an average year, and 9 percent in a dry year. But the Delta is more important than its share of water because it is the hub of the two largest water systems in the state, the federal Central Valley Project and the State Water Project. These projects use the Delta as a hub of their water conveyance system. The Delta also plays that role in some local water systems such as Contra Costa Water District, while other users take water directly from the Delta's waterways for use in the Delta. In total, taking water from the Delta has increased significantly over the past half century, mostly for export. These patterns are shown in Figure 7a.

and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

Figure 5. California Precipitation History



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

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

As this vision has emphasized, actions in the Delta watershed are not the only relevant factor to meeting the charge of Executive Order S-17-06. Actions outside the Delta are critical to the Delta ecosystem and California's water systems. Understanding the full pattern of water uses in the Delta watershed is not simple. The data collected are not easy to find or to use. Figure 7b, "Historic Diversions before the Delta, in-Delta Uses and Exports from the Delta, plus Outflows" shows 75 years of data that provides one available portrayal of these complex patterns of water use.

A much fuller understanding of water uses across the entire Delta watershed is needed if California is to manage its water supplies effectively over the next decades. Some progress in developing and analyzing these issues can be made during the strategic plan phase of Delta Vision and more can be made over the next several years. Understanding information available from the State Water Resources Control Board is a high priority. Currently pending at the State Water Resources Control Board are applications to appropriate an additional

4.8 million acre-feet of water upstream of the Delta. Additional water has been reserved by the State Board for future upstream appropriations (state filings). Finally, some holders of existing water rights permits upstream of the Delta have not yet fully developed those rights. The quantity of water undeveloped and reserved in state filings has not yet been estimated, but is thought to be significant.

Improving the understanding of diversions throughout the Delta watershed is critical to effective policy making. More than information is needed, however; California must also develop capacity to make policies which balance these uses of water.

The Delta ecosystem is impacted by diversions around the Delta, exports from the Delta, and in-Delta uses.

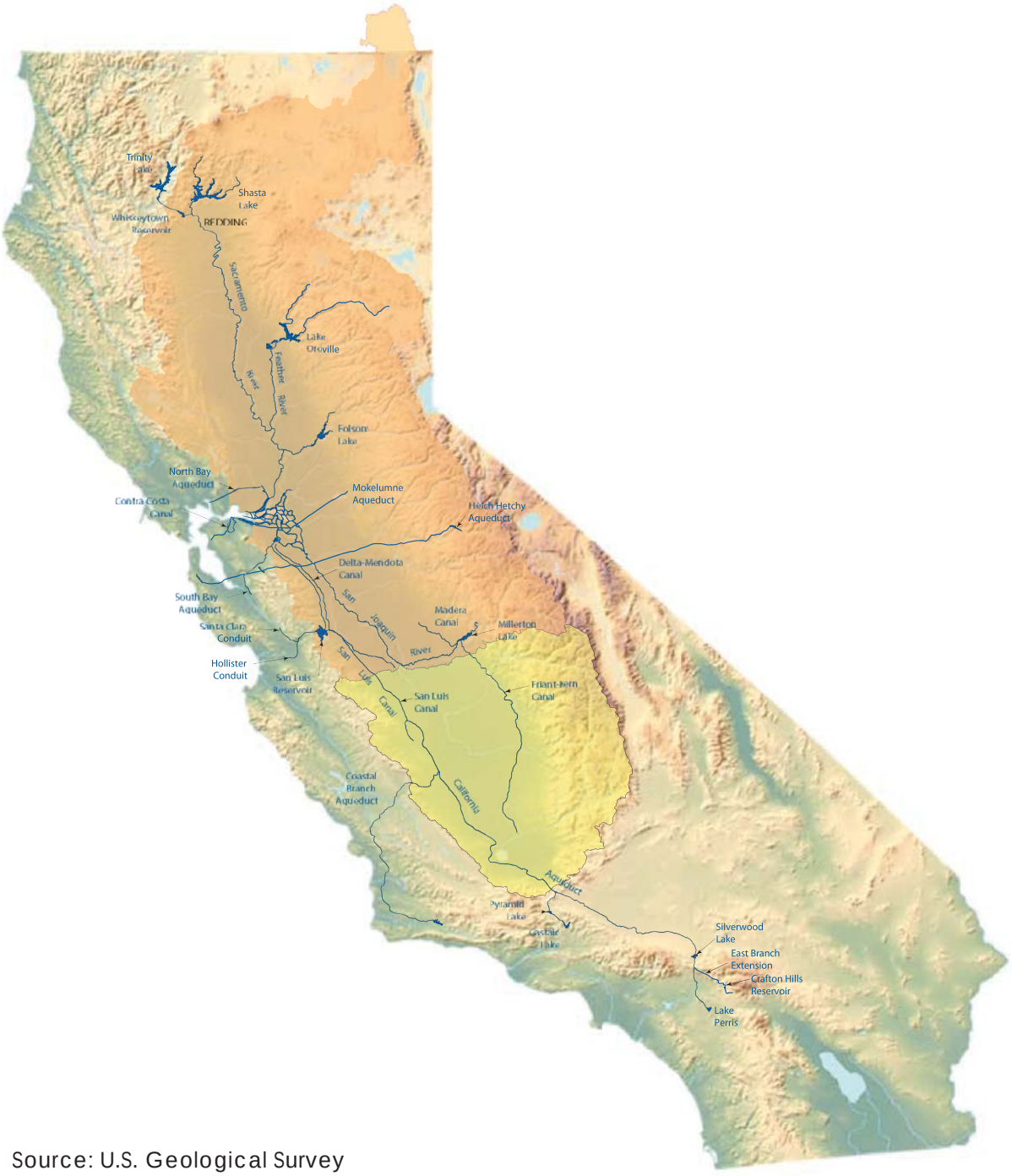
This vision treats the water supply and its ecosystem as co-equal values, each central to the future of the region and to California. In order for both to thrive, the ecosystem must be protected from the operations of the Delta pumps and other diversions from within the Delta or upstream. To achieve this protection, actions must proceed in a staged and transparent manner, so their effects upon both the ecosystem and the water supply can be fully evaluated. A series of performance standards, widely agreed upon by stakeholders, must be the basis for these evaluations.

As greater protection is achieved, management of both the water system and the ecosystem must proceed in an adaptive manner. In a system as dynamic as the Delta, and with climatic and other conditions changing in unpredictable ways, it is essential that management flexibility be preserved and exercised. This may mean creating multiple pathways for water conveyance so critical water supplies cannot be interrupted completely by levee failures, salinity intrusion, or other sudden changes.

All water conveyance should be designed to be quickly recoverable in the event of a major disaster. Designs for storage and conveyance should incorporate expectations of reduced diversions upstream, within and exported from the Delta during dry periods, and also the need to capture, convey and store water when least harmful to the environment. The systems of storage and conveyance should be designed to accommodate expected transfer of water from points of capture to points of use, recognizing that such transfers are critical to meeting water needs but must be accomplished with the least negative ecosystem impacts.

New storage, both in ground and above ground, and improved conveyance must be constructed to capture water when least environmentally damaging,

Figure 6. Map of Delta Watershed Boundary



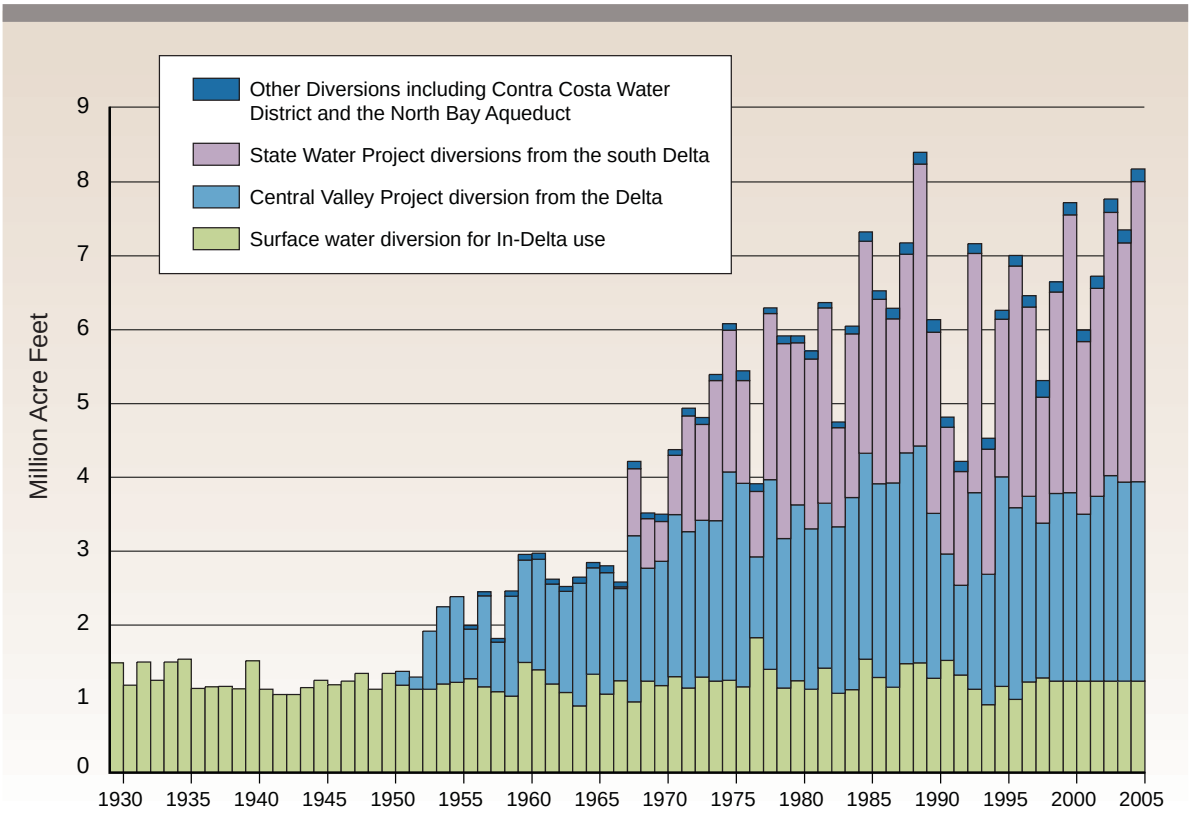
Source: U.S. Geological Survey

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

and to efficiently move it to areas of need. Building new conveyance alone, without new storage, would seriously compromise the ability to protect the estuary and provide sufficient environmental flows. Storage and conveyance must be coupled in order to operate the system with sufficient flexibility to protect both the environment and economy. The storage and conveyance systems should also meet water quality standards (which are tightening) and also allow operation of legal water markets.

Figure 8 shows how water from the Delta watershed is used both within that watershed, in coastal urban areas, and in the Tulare Basin (where most use is for agriculture). As a result of these conveyance projects, the majority of Californians, in one way or another, use water from the Delta and its watershed. However, it is important also to understand that most water systems in California are local projects and that the State Water Project and the federal Central Valley Project provide modest supplies of the total dedicated water used in the state.

Figure 7a. Historic Diversions from within the Delta

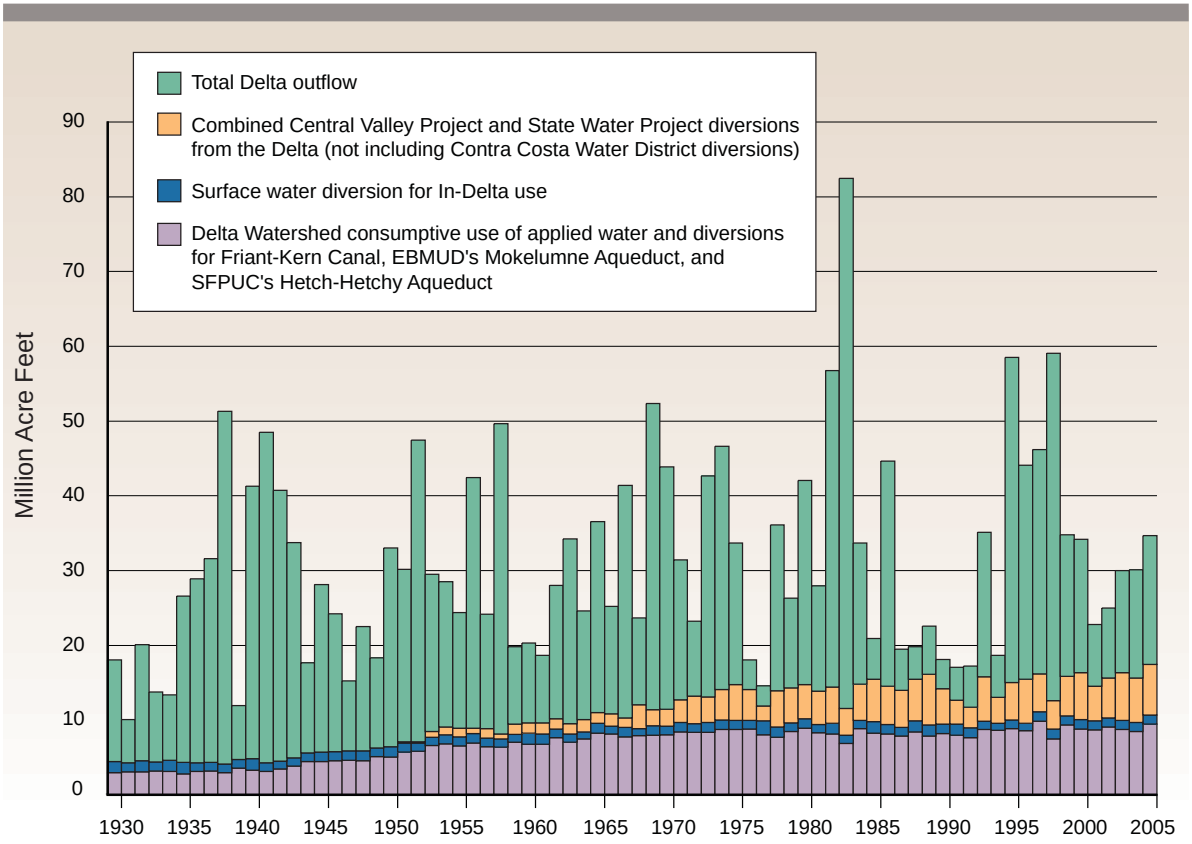


Source: Measured, calculated and modeled from an array of data sources as compiled by Tully & Young, Inc.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

Figure 7b. Historic Diversions before the Delta, in-Delta Uses and Exports from the Delta, plus Outflows



Trends in Destinations and Uses

Period	Average Annual Total (MAF)	Outflow	in-Delta	Exports	Delta Watershed
1930 to 1949	25.80	81%	5%	0%	14%
1950 to 1969	31.71	67%	4%	4%	24%
1970 to 1989	34.34	51%	5%	15%	29%
1990 to 2005	32.85	48%	4%	17%	31%

When the averages of 20-year periods are compared, these data show:

- Outflows to the ocean go down from 81% to 48% of total flows;
- In-Delta uses are essentially constant at 4% to 5% of total flows;
- Exports of water taken in the Delta but conveyed elsewhere go up, from zero to 17% of total flows; and
- In-Delta watershed (before reaching Delta) uses also go up, from 14% to 31% of total flows (some of these are exported from the Delta watershed).

Source: Measured, calculated and modeled data from an array of sources as compiled by Tully & Young, Inc. with data and assistance from DWR, the Bay Institute and the State Water Contractors.

VISION

It must be reconstituted to better function as an estuary which supports native species and recreational fishing and to be most resilient to future changes. **More than half of Californians rely on water conveyed through the Delta for at least some of their water supplies** and Delta watershed water is critical to much California agriculture, supplies threatened by harmful impacts of current practices on the environment, impaired

More water is commonly exported from the Delta in average or dry water years than is exported during wet years. In wet years, about 4.6 million acre-feet of water is exported from the Delta; in average and dry years, water exports are about 6.3 million and 5.1 million acre-feet, respectively. The current infrastructure for water conveyance and storage limits ability to capture and store water during high flows for use in dry years. Figure 9 shows these relationships.

California's constitutional principles provide a reasonable way to allocate water uses over time

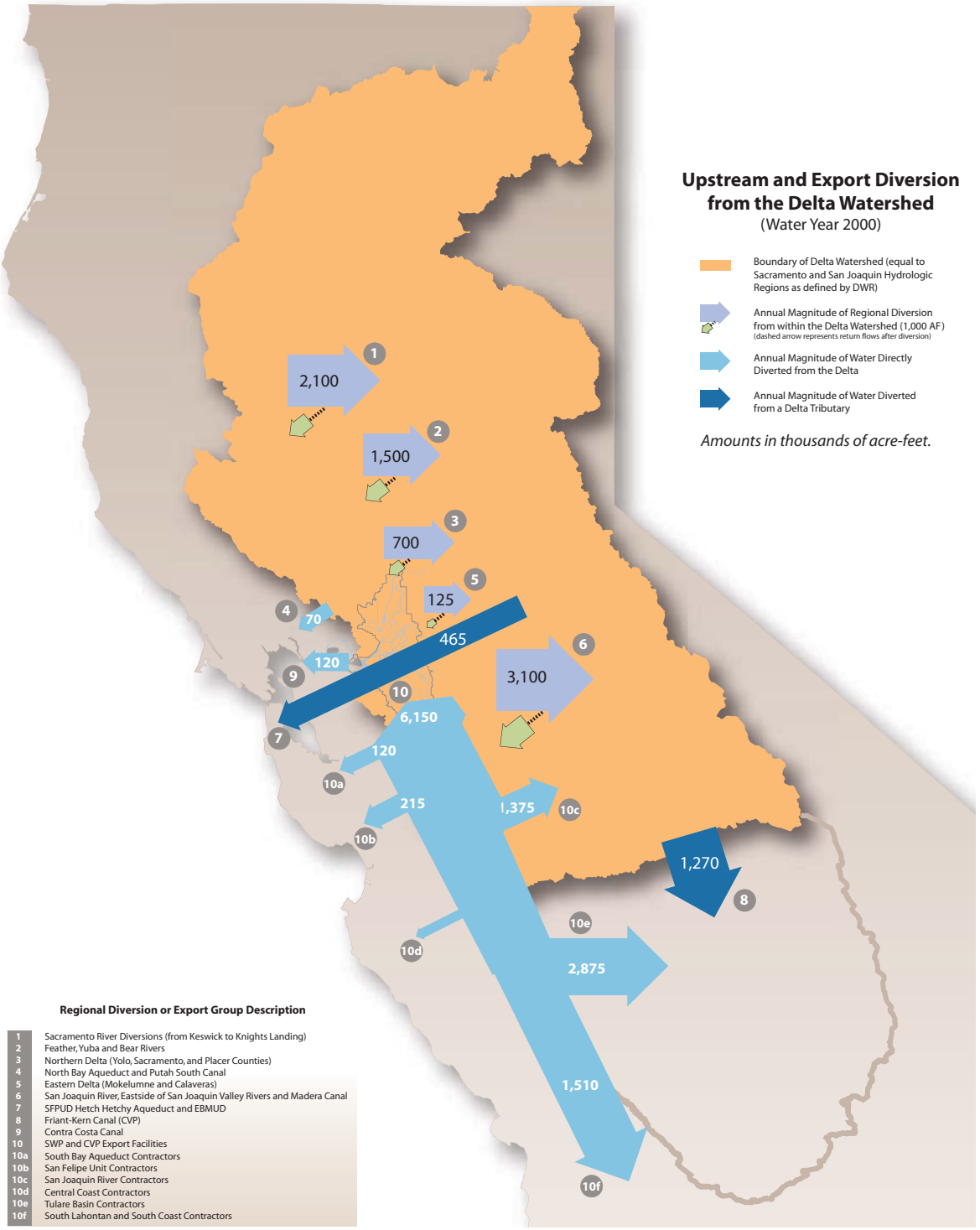
This capture, storage, and conveyance occurs under water rights law where the Central Valley Project or State Water Project, or other users, hold rights to divert water from upstream sources, store it in reservoirs, and then convey it in canals and by pumps to points of use. Water is essential to human life and health, and human consumptive uses are the top priority for developed water supply in California under existing law. Water supply, regardless of source, also is an important part of the California economy. Thus, water is both an important natural resource and an important economic resource. There is great competition for the limited amount of developed water supply. A new attitude and approach to water supply development and water use must take hold in California.

Public trust principles, well established in the American legal system with roots back to England and parallel principles in other legal systems, provide a way to frame decisions about the use of water in the Delta and Delta watershed. In our legal system, water is not owned by any user, but the State of California and public retain ownership. Users gain the right for use of water in various ways (riparian, appropriative, etc.), but those rights are conditional as stated both in the term reasonable use and by the underlying public trust for protection of the resource. Public trust principles should provide an ethic and foundation for public policymaking regarding water resources in all of California and is especially relevant and important in the Delta.

Reducing dependence on the Delta means building greater regional water self-sufficiency throughout California. Most attractive storage opportunities have already been developed; there is a dam at almost every highly-effective site. The sites left for building dams often have high environmental impacts or high cost for their yield. Therefore, there have been few major dams constructed in California recently.

Figure 10 details the water sources for urban uses in California, confirming the pattern just discussed. All urban areas of California rely on some water from the Delta and its watershed, but the proportions vary tremendously.

Figure 8. Upstream and Export Diversions from the Delta Watershed



Source: Greg Young, Tully & Young, Inc.

system functions continue to serve all Californians dependent on water from the Delta watershed. ***A durable vision for sustainable management of the Delta must be comprehensive.*** It must integrate the co-equal values of ecosystem and water supply, ensure that conservation and construction both take place, and develop effective systems of water

California must also develop water from all available sources in order to reduce dependence on the Delta. Figure 11 is a summary of the analysis of potential water demand reduction or supply augmentation for eight strategies from Update 2005 of the California Water Plan. These strategies need to be further developed and pursued as possible.

d. Delta levees and floodplain management

> *Statement:* Reduce reliance on levees, which pose risks to public safety and require investment in maintenance in perpetuity. Improve floodplain management to reduce flood pressures on levees and communities and to increase ground water storage.

This vision's goals for the water system, for other infrastructure, and the Delta as a unique place all require a reliable and recoverable levee system. Levees are the fine threads that stitch together the Delta waterways and landscape and that make most current human uses of the land and water possible. As in New Orleans before Hurricane Katrina, however, the Delta's levees and the protection they provide are too often taken for granted. Levees require continual attention, investment, and maintenance, especially in situations where they protect water supplies and also land below sea level. The care of Delta levees will therefore be a key responsibility for state and local government and Delta inhabitants, in perpetuity.

Given the risks of levee failures and the requirement for continuing maintenance against increasing threats, the State of California should adopt two policies:

1. California's reliance upon levees should be reduced wherever possible and avoided in the future. As an example, reliance of critical infrastructure on levees should be minimized where possible.

2. The State of California should adopt standards for levels of protection afforded by levees of different design and determine allowable land uses in areas flooded when levees fail.

However, allowing numerous levees to fail (either gradually or en masse) is not desirable because of the damage it would do to the Delta's regional economy even if water conveyance were secure. And yet, fully fortifying all of the levees against the many threats they face—ranging from earthquake risks to subsidence to climate change—would be astronomically expensive.

For these reasons, levee management must emphasize recoverability from, rather than resistance to, failures of all kinds.

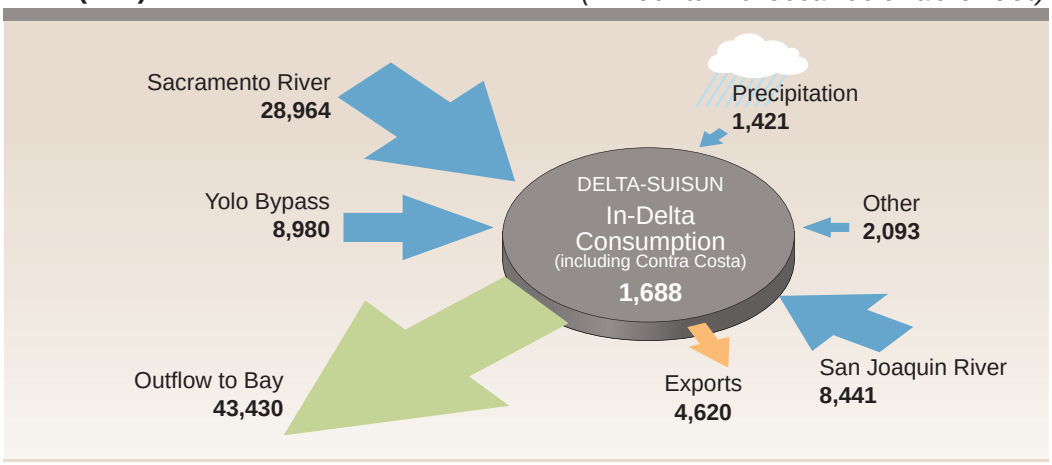
and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

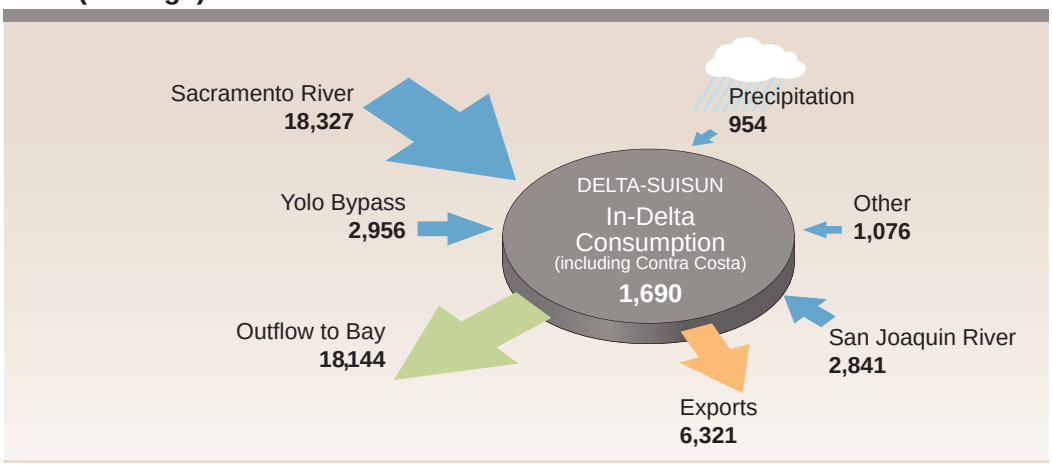
Figure 9. Delta Water Balance by Water Year Type

(Amounts in thousands of acre-feet)

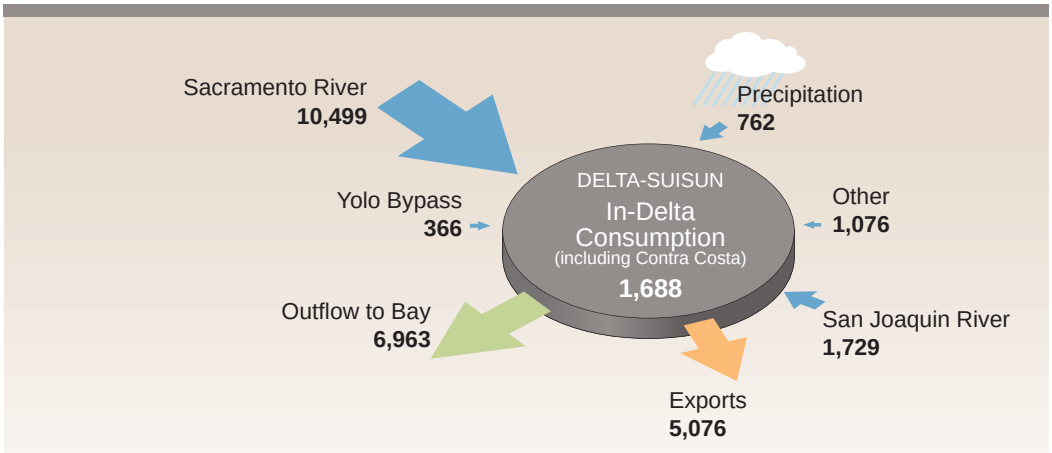
1998 (Wet)



2000 (Average)



2001 (Dry)

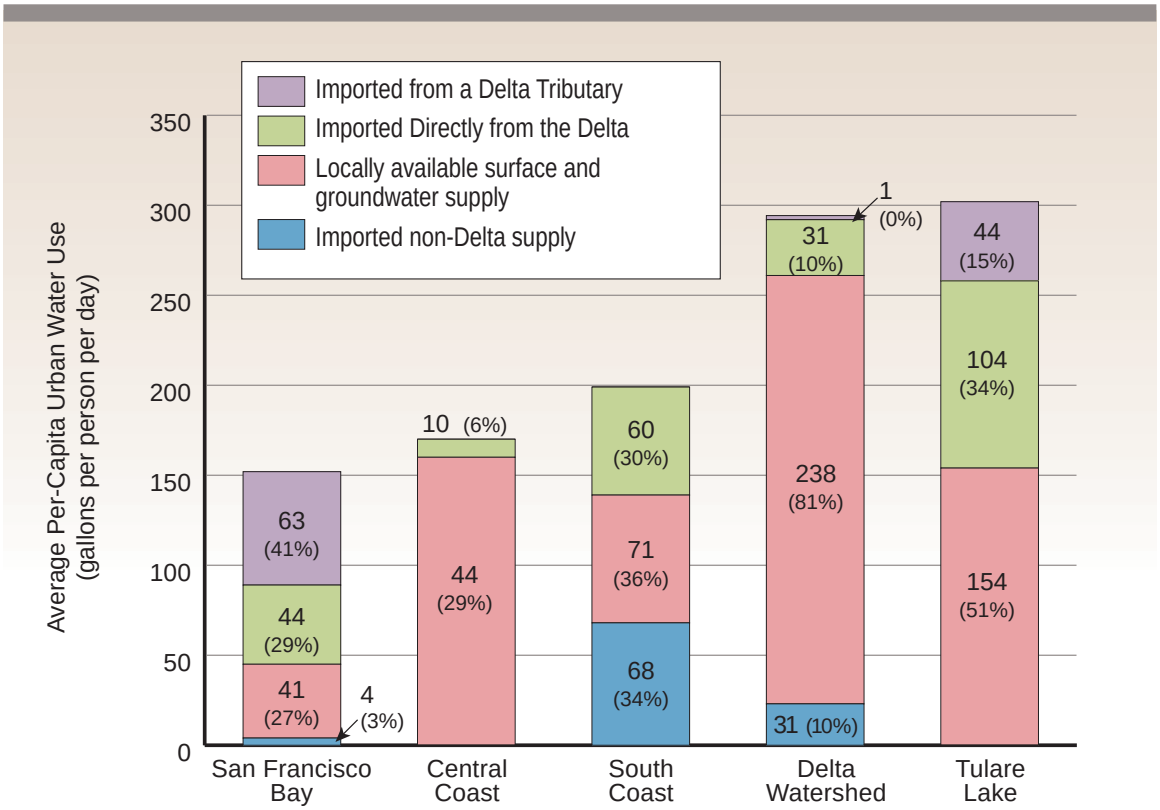


Source: Status and Trends of Delta-Suisun Services, URS Corporation 2007

to achieving resiliency in water systems. There are many ways to achieve this resiliency. ***The state must encourage regional self sufficiency*** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

In addition, the state and local water agencies must vigorously investigate all opportunities for conjunctive management that maximizes water efficiency through coordination of both surface water and groundwater resources—reservoirs, floodplains, and groundwater aquifers. Conjunctive management that infiltrates more wet-season runoff into the Central Valley's groundwater aquifers, for example, has the potential to reduce flood pressure on the Delta and to expand local dry-season supply. Conveying that water from surface

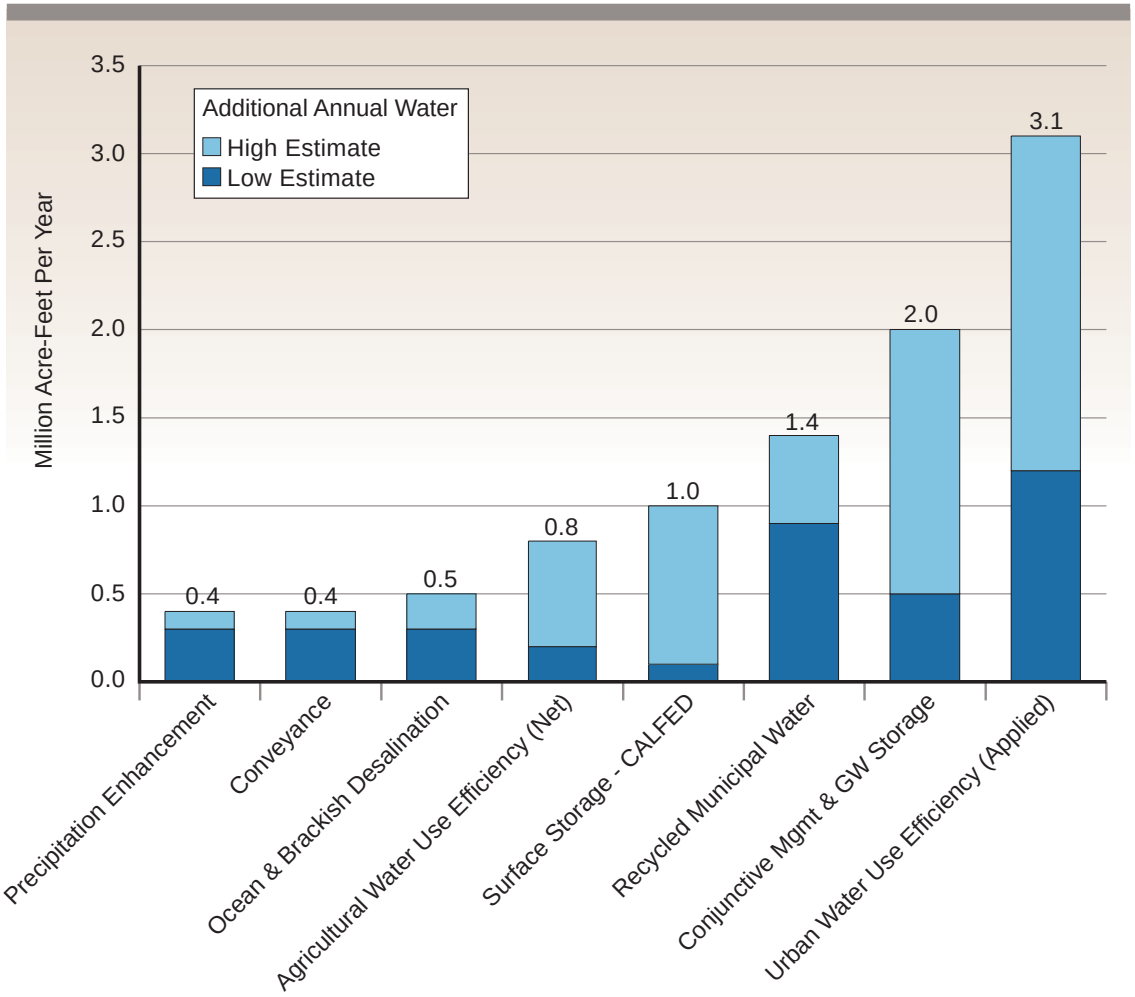
Figure 10. Estimated Distribution of Water Sources used to Meet Daily Urban Water Demand (Water Year 2000)



Using data from the 2005 California Water Plan Update, v.3, this graphic shows an estimated representation of how various sources of water available to a region may have been used to meet a region's urban per-capita water use. However, because data is not distinguished to separate the destination of source water, some of the water available to a region may have gone exclusively to agricultural uses or urban uses, thus skewing what is represented here.

Source: Department of Water Resources

Figure 11. Strategies to Reduce Demand for/or Increase Supply of Water



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.

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

reservoirs to infiltration sites through existing river channels can also help restore riverine habitats, especially in the de-watered reaches of the San Joaquin River. These conjunctive management strategies must also include the Tulare Basin, which, although not naturally hydrologically connected to the Delta except in wettest years, is a major consumer of Delta water for agricultural irrigation and has very large groundwater storage potential.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

IV. Recommendations for Near-term Action

Although our charge in Executive Order S-17-06 was to develop a "durable vision for sustainable management of the Delta" —a vision— some of the threats to the Delta and Suisun Marsh are so serious that specific recommendations for short- and mid-term actions are warranted. Something needs to be done—and done in the very near term—but within the context of our vision.

Recent efforts by the Governor and the Legislature to keep people and development out of flood-prone areas and to seek a higher level of flood protection in the Delta and related areas have been impressive. Voter approval of bonds for flood management illustrates that Californians are coming to terms with their water and environmental problems. However, much more remains to be done to improve public safety and the integrity of water delivery systems and infrastructure.

Proposals to improve the functioning of the Delta ecosystem and the current water conveyance and storage system also warrant immediate attention. Lists of "no or low-regrets" proposals for actions in the Delta have been advanced over the past months. Upon examination, it becomes apparent that most of these proposed actions do have risks, many would impact some interests or values negatively, and virtually all will require months to years for design and permitting before implementation.

Any proposed near-term action should flow directly from key goals, principles, and outcomes contained in the vision. Likewise, each should be capable of starting rapidly, even if completion of the work may take several years.

These near-term actions help ensure the following:

- Opportunities to achieve long-term goals are not lost.
- Appropriate legislative decisions on resource allocation and funding are consistent with a long-range, comprehensive perspective.
- Early action is taken on key issues.
- The stage is set for decisions on longer term actions or projects that have yet to receive funding, design, permitting, or contracting.
- All groups of people interested in water issues are given the opportunity to be heard before final action is taken.
- Current risks to life and property are recognized and reduced, and the State's interests and exposure to liability are protected.

and conflict, to no one's benefit. This principle does not imply that these two values can somehow be held in balance in every policy or management decision at every scale. ***The water system and the ecosystem of the Delta are co-equal values that must be preserved on equal footing.*** California cannot sacrifice either the unique estuarine ecosystem of the Delta or the critical water supplies that power the state's dynamic economy.

These near-term actions need **not** be characterized as easy, as low-hanging fruit, or as having no regrets. Some may, in fact, be highly difficult or contentious, yet be essential because of a strong need and rationale. In any case, near-term actions should first attempt to build upon existing organizations and authorities, but not be bound by existing shortcomings.

In each case below, we have identified actions that can be launched in the near term and appear to meet the criteria above. These actions should be initiated quickly, recognizing that the required analyses and permitting will require months to a few years for some recommendations.

1. **State government should immediately begin acquiring title or easements to floodplains, establish flood bypasses where feasible, and discourage residential building in flood-prone areas.** This cannot wait. Land that could provide flood protection is being threatened by urban development as this report is being written. Because flood protection begins with minimizing high waters, it is obvious that the acquisition of identified floodplains must start now and be pursued aggressively. Local regulatory agencies should avoid putting life and property at risk in flood-prone areas including those expected to be impacted by sea level rise and climate change.

2. **The Governor should immediately issue an Executive Order that provides guidance consistent with this vision on inappropriate land development in the Delta.** It is impossible to protect or improve the Delta ecosystem or guarantee a stable water conveyance system (whether through or around the Delta) if urban encroachment continues. The Task Force intends to further address these issues early during development of its strategic plan.

3. **State government should promptly set appropriate standards for all levee improvements to protect heavily populated areas and key parts of the water delivery system and other infrastructure. The State of California should also use available bond funds to address strategic levee and floodplain improvements.** These levee standards must take into consideration both the degree of vulnerability of a given area and the degree of human inhabitation and economic value of the land uses and infrastructure being protected. Ongoing studies of Delta levee-failure risk and experts should be consulted in the formulation of these standards. Propositions 1E and 84 provide funds for improvements of levees and/or floodplains. Those funds should be allocated in manners consistent with this vision.

4. **State government should embark upon a comprehensive series of emergency management and preparation actions within a few months.** California cannot wait for a flood before planning our response, so the following actions must commence immediately:

   - Clarify chains of command for responses to emergencies.
   - Establish clear benchmarks for recommending and demanding evacuations.
   - Develop good regional evacuation plans, including evacuation routes and shelter locations.
   - Begin emergency response exercises and drills with citizens as well as emergency response personnel.
   - Stockpile and pre-position supplies, including caches for citizen emergency response.
   - Earmark money and give spending authority for rapid response.
   - Sign contracts for barges along the West Coast to move people and supplies. In a major event, California will likely need help from other states and any existing mutual aid agreements should be assessed and improved as needed.
   - Ensure that adequate human labor resources to repair breaches will be available, and sufficiently mobile in the Delta, after any potential disaster.
   - Set up a Boat Search and Rescue Marshall Program for rapid evacuation of neighborhoods.
   - Change building codes to require exits to a building's roof from the inside.
   - Paint lampposts on every block behind levees to show the 100-year flood or sea level to address human tendencies to underestimate risks and avoid disaster preparation.
   - Begin required school programs about emergency training.

   State government should also immediately conduct an emergency disaster planning exercise in the Delta, involving all appropriate federal, state, and local agencies. Although such an exercise may cost a significant sum of money, it is money well spent.

5. **State government should promptly incorporate expected sea level increases into decision-making and improve knowledge of constructing more secure and affordable levees.** In planning

The Delta is and will remain a powerful mixture of natural and human forces. ***We must learn to work with nature to achieve desired goals in the Delta.*** While human designs and engineering may support enhanced ecosystem function, as when human cultivation of tules and wet land crops helps rebuild subsided islands, or management of tidal action helps to recreate marshes, but much of the actual regeneration occurs by natural processes. The state must

for any actions related to this vision, or any actions in areas projected to be impacted by sea level rise, all state agencies and local governments should publicly announce the expected sea level rise incorporated into their decisions. They should also detail how their decisions have anticipated and made provision for that projected sea level rise. Second, the State of California should fund a focused program of levee research to develop more affordable and efficient seismic protection designs. Previous engineering experience with seismic retrofitting of dams suggests that such research could cut the cost of seismically secure levees by at least one-third.

6. **High priority ecosystem revitalization projects should be pursued aggressively by the responsible agencies and departments, upon direction by the Governor.** The selected projects should receive highest priority in allocation of funds, including bond funds. As the new Delta governance entity recommended by Delta Vision is created, it should be charged with implementation of these projects and allocate or oversee all related funding. Until then, the Legislature should provide oversight on the progress of these projects.

   All policy efforts focused on the Delta identify several high-priority ecosystem projects, and there is a relatively high level of agreement on those projects. In some cases, the projects proposed to improve Delta ecosystem function differ from current proposals developed from other perspectives by local governments or state and federal government. Those differences should be resolved quickly. Given the statewide importance of success in improving functioning of the Delta ecosystem, the presumption should be established that conflicting policies and proposals developed to satisfy other policies should be changed as necessary. The ecosystem design team created under Delta Vision is analyzing proposed projects and will produce a list of recommended ecosystem restoration projects by early 2008.

7. **Improvements in the current water conveyance and groundwater and surface water storage systems should be pursued as rapidly as possible by the responsible agencies and departments, upon direction by the Governor.**

   As with ecosystem revitalization, policy efforts focused on the Delta identify several high priority improvements to the current water conveyance systems and ground and surface storage that have multiple expected benefits and realistic hope for success. Included here are actions to improve the performance of the existing conveyance system,

and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

such as dredging the Middle River. These projects should receive the highest priority in allocation of funds, including bond funds. As the new Delta governance entity recommended by Delta Vision is created, it should be charged with implementation of these projects and should allocate or oversee all related funding. Until then, the Legislature should provide oversight on the progress of these projects. The State of California should complete studies of ground and surface storage as rapidly as possible so they are available to inform decisions about investments in water systems.

A Delta farm manager shows off some of the tomatoes grown in the California Delta. The Delta is a highly productive agricultural area of California.

to achieving resiliency in water systems. There are many ways to achieve this resiliency. ***The state must encourage regional self sufficiency*** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

The USS Potomac, "The Floating White House" of President Franklin D. Roosevelt, travels toward an historic Delta bridge on its way to Old Sacramento.

V. Governance

The Delta combines extraordinary value, extraordinary risk, and extraordinary uncertainty all in the same place. Despite many studies and varied policies and programs, a strong sense of uncertainty about the effects of human action is still the most accurate characterization of our understanding of the Delta today.

Far from being a prescription for paralysis, however, recognizing both uncertainty in knowledge and uncertainty about outcomes of policies and programs has very specific implications for future Delta management. Managing a valuable resource of any kind under conditions of uncertainty calls for common sense—spread risks, create backups where possible, work in reversible steps, and learn from experience. The State of California must act decisively and deliberatively to reduce known threats, but must also adopt a long-range stewardship philosophy that results in a resilient Delta environment and a reliable water supply system for California.

Needed energies must be mobilized, often in the face of opposition. A related challenge is to adapt strategies over time as experience reveals unexpected consequences, and science or technology creates new understanding and new tools. Current ways of making policy, providing incentives, distributing liabilities and financing need to change for this vision to be successful. The over-arching issue for all these challenges is "governance."

California's Delta is its largest estuary and lies at the center of a complex statewide water system. This water system combines the massive engineered state and federal water projects with a diverse range of local water management activities. Despite its importance to California, uses of the Delta are not governed effectively. No current governance structure effectively addresses the range of policy issues or threats facing the Delta today. There are at least 220 governmental agencies with some authority for different aspects of the Delta. Moreover, there are only inadequate ways to organize existing agencies and jurisdictions toward broad functions in the Delta. Additionally, there are incentives to misuse or overuse Delta water that ensure a constant over-subscription of the resource.

Effective governance is necessary to improve the Delta's estuarine ecosystem and capacity to export water. The first issue to address is what needs to be governed in order to meet the charge of "sustainable management of the Delta"? This vision identifies at least five areas needing governance reform:

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

1. Integrating the two critical co-equal values of ecosystem and water system functions into policies and investment choices, while incorporating the other values society seeks through the Delta.

2. Shaping land forms and land uses within the Delta and critical nearby areas consistent with this vision.

3. Integrating management of Delta-relevant water systems and ecosystem protection and improvement projects, including the authority to adjust rapidly to achieve the stated goals.

4. Shaping decisions in the Delta watershed which affect Delta water flows (quantity, timing, quality).

5. Establishing policies which improve water uses across California, including conservation, system efficiencies, and improvements that lead to regional self-sufficiency, and permit the reasonable exchange of water among users.

For the first area of governance, of integrating the two co-equal values, a single entity with a statewide perspective is needed. This entity would ensure integrated action to implement this vision, including application of the constitutional principles of reasonable use and public trust.

That entity must have (a) sufficient authority, including over ecosystem improvements and water diversions and exports, (b) sufficient financing to sustain activities over decades, including ability to impose fees on those who use water resources from the Delta watershed or otherwise impact the Delta ecosystem, (c) have clear, effective working relationships with federal and local agencies and officials (d) incorporate contributions of stakeholders, probably through structured collaborative processes, and (e) be supported with state and federal policies which align incentives and costs for individuals, businesses, and others with the vision.

In addition to this single entity, other structures will be needed to address critical issues or to provide arenas for needed stakeholder and expert participation in decision-making processes. For example, the second area of governance involves parcel-specific land use decisions within the Delta required to achieve the vision. These decisions would be made within the policies adopted by the first entity. This responsibility should be the charge of a separate body that includes heavy representation of relevant local governments. An entity that helps to mobilize public involvement and motivate desirable outcomes consistent with this vision should also play a key role in long-term Delta stewardship.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

This governance system must be supported by robust programs of science focused on improving understanding of the Delta and of the effects of policies and programs.

Further development of proposals on governance will occur as more detailed work takes place during the strategic planning stage of Delta Vision in 2008. Successful approaches to governance in all five areas identified above are needed, but not yet identified. At this stage, seven attributes required for success of a governance entity are identified:

- Has needed authority
- Can make needed decisions balancing critical values
- Can ensure implementation of its decisions, including control of needed finances and sufficient legal authority
- Is responsive to society and major constituencies
- Is accessible to all and equitable in its decisions, meeting expectations for justice in our society
- Can change over time to better meet its goals
- Is supported by an effective financing system that receives funds from those who benefit from use of the public resource or public policies where ever possible

The existing entities charged with major roles in governing the Delta relevant to the five identified areas do not have all of these attributes. In considering changes, it is desirable to use existing governance entities and systems where possible, but they are often hard to change, so major restructuring may be needed. When restructuring is required, it is important to clearly express new roles and remove old activities.

Moreover, as urgent action is needed to address these long-standing, critical problems in the Delta and California's water systems, the new governance entity must have powers to act quickly.

Additionally, governance is not just about institutions and policies. It is also desirable to join decision-making, financing, and liability wherever possible; this is a governance principle applicable from institutions to individuals. The opportunities and costs experienced by families, businesses, farmers, and other governments are affected by the policies of the State of California. Effective governance requires aligning these opportunities and costs in ways that support achieving desired policy goals.

It must be reconstituted to better function as an estuary which supports native species and recreational fishing and to be most resilient to future changes. ***More than half of Californians rely on water conveyed through the Delta for at least some of their water supplies*** and Delta watershed water is critical to much California agriculture, supplies threatened by harmful impacts of current practices on the environment, impaired

It is reasonable to expect that progress on the vision will be uneven for several reasons: results from enacted policies will come in at different times; some interests will resist policy changes; and some policies will not work and need to be revised. This unevenness is one reason for designing governance systems with resiliency in mind.

A container ship travels along the San Joaquin River. The shipping channel cuts through the natural river meander, and past farm land.

VI. Summary

Virtually every person who presented views to the Task Force echoed the premise of Executive Order S-17-06 under which we work: The current condition and uses of the Delta are unsustainable. Rising sea levels will lead to intrusion of salt water farther upriver in the Delta, altering the ecology of fish and plants and contaminating waters withdrawn for diversion to agriculture and urban uses. Inevitable floods will inundate vast areas, overwhelm levees, destroy property and infrastructure, and endanger lives in flood-prone areas. Less certain but potentially more catastrophic earthquakes could profoundly alter the physical geography of vast areas of the Delta, obliterating settled areas with major flooding, destroying bridges, levees, roads, power transmission, gas pipelines, and buildings.

Our vision accepts the judgment that the current situation of the Delta is not sustainable. We recognize, among all the uses that must be accommodated in planning for the future of the Delta, two overriding priorities – ecosystem protection and water provision for human use.

By giving a priority to ecosystem protection, we do not mean restoration to historical conditions that prevailed prior to the alterations that humans have effected over the past two centuries. We mean adapting patterns of construction, settlement, and uses to enhance the functioning of the Delta as an integral part of the San Francisco Bay-Delta Estuary to the extent practicable within a relatively mature and developed economy.

By assigning a priority to water provision, we do not envision any increases in available supplies for export outside the Delta. To do so would compromise our priority for ecosystem protection.

For success over generations, our policies for ecosystem protection and water provision must be designed not for one best solution, but for resiliency, for the capacity to recover from threats and adapt to changes, many of which we cannot now predict with accuracy. We must also develop policies which respect and work with natural processes rather than seek to bend nature to our engineering designs. Resilient natural systems help to sustain resilient human systems. We should also respect human aspirations and capacities and develop policies that mobilize the great energy of Californians to act individually and in families, firms, and non-profit organizations rather than relying solely on state or federal governmental actions and regulations to achieve the desired vision.

We must govern differently, integrating policymaking for ecosystem protection and water provision, protecting the Delta as a place of value and also of living communities, and achieving needed changes in water delivery and use across

system functions continue to serve all Californians dependent on water from the Delta watershed. ***A durable vision for sustainable management of the Delta must be comprehensive.*** It must integrate the co-equal values of ecosystem and water supply, ensure that conservation and construction both take place, and develop effective systems of water

all California. The Delta watershed is critical to the future of California, and changes in conveyance and storage are required. These actions must occur as the ecosystem is protected and all California moves to a more efficient and resilient water system. Changed institutions, policies, financing systems, and distributions of liabilities are required to move a fragmented system for decision-making toward the vision proposed.

Achieving durable, sustainable management of the Delta requires comprehensive, integrated policies, well-funded and pursued over decades through an effective governance system that ensures continuity of action while adjusting policies and programs as needed in pursuit of this vision.

Executive Order S-17-06 requires the Blue Ribbon Task Force to develop a strategic plan by October 2008. The Delta Vision Committee recommends its vision and strategic plan by November 2008. Further development of the ideas in this vision will occur during the strategic plan phase. If information developed during this and related processes suggest refinements in this vision are desirable, those changes will be considered. In particular, the Task Force will seek to create quantified targets for performance on the key goals of this vision. Benchmarks should be established by which to evaluate progress toward the target at specified times, such as two, five, and 10 years.

The following are among the specific topics to be considered in the strategic plan phase, in each case to further implementation of the vision:

1. Addressing those factors enumerated in Executive Order S-17-06 consciously set aside during the vision process (e.g., transportation and utility corridors or recreation).

2. Ecosystem revitalization to improve estuarine function.

3. California water rights and contracts.

4. Effective ways to accelerate water conservation and increase regional self-sufficiency.

5. Long-term transition strategies.

6. Strategic financing plan.

7. Effective roles for local, state, and federal government agencies.

This is not an exhaustive list, nor an indication of priority in importance or attention. The Task Force anticipates its first meeting to develop a strategic plan in late January or early February 2008.

and ecological functions it provides – to survive what could otherwise be catastrophic shocks. ***We must design for resiliency***, both in the Delta and in the California water system as a whole. Reducing reliance on the water from the Delta is critical to achieving resiliency in water systems: the state must encourage regional self sufficiency and develop alternative ways to move water among areas of the state. We should

a margin of safety for key ecological, water supply and public safety functions in the short term. ***Taking "no action" is not acceptable.*** Any vision for the future of the Delta will be accomplished over decades, during which time the safety of those living in the Delta must be protected, and methods found to ensure ecosystem

VISION

The vision achieved: By the 22nd century, California's Delta is a vibrant and safe place to live, work, and recreate. It is a place where the heart of California beats to a strong, steady rhythm of river flows, estuarine life, and human activity.

The Delta will look different, with more areas experiencing tidal flows and broad corridors of natural and semi-natural habitats connecting marsh to extensive uplands. The Delta will also be used differently, with land uses, water exports, and recreational uses that respect and work with the natural processes of the estuary.

As this vision is realized, California's Delta will be a place where foresight, learning, and flexibility have resulted in a fruitful integration of the environment and the economy. In the 22nd century, California's Delta is a showcase for the nation and the world of how to integrate nature and technology. In the 22nd century, California's Delta functions as an integral part of a vital estuary, teeming with life. In the 22nd century, Californians have reliable supplies of high quality water from many sources, including the Delta.

to achieving resiliency in water systems. There are many ways to achieve this resiliency. ***The state must encourage regional self sufficiency*** and develop alternative ways to move water among areas of the state. A restored ecosystem may require diversions, and or changes in the patterns of those diversions, upstream, within the Delta or exported from the Delta.also expect that water exports from the Delta will be

DELTA

Acknowledgements

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DELTA

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These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

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and conflict, to no one's benefit. This principle does not imply that these two values can somehow be held in balance in every policy or management decision at every scale. ***The water system and the ecosystem of the Delta are co-equal values that must be preserved on equal footing.*** California cannot sacrifice either the unique estuarine ecosystem of the Delta or the critical water supplies that power the state's dynamic economy.

Bay-Delta Conservation Plan

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External Submissions of Delta Visions

The following is a list of individuals or organizations that provided their vision for the Delta to the Delta Vision Blue Ribbon Task Force. Copies of these external submissions are available at the Delta Vision website, http://www.deltavison.ca.gov

A Long Term Vision for the Sacramento-San Joaquin Delta: A Work in Progress
The Bay Institute, Natural Heritage Institute, natural Resources Defense Council, The Nature Conservancy, Planning and Conservation League, California Water Impact Network and Environmental Defense.

A Water Plan for the 21st Century
In-Delta Group

An Alternative Vision for the Sacramento-San Joaquin Delta
Peer Swan

Delta Corridors
Russ Brown, Jones and Stokes

Delta Vision Statement of Principles and Summary Vision for the Delta
Contra Costa Council

Environmental Justice Delta Vision
Environmental Justice Coalition for Water

Untitled
Restore the Delta

Delta Fishery Recovery and Restoration Vision
The Allied Fishing Groups

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Appendix 1. Delta Vision Process

The Governor's Executive Order S-17-06 (Appendix 2) recognized the value of California's Delta and risks to its future. It formed the Delta Vision process to "develop a durable vision for sustainable management of the Delta" that can "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."

Four groups, each with a distinct charge, were established under the executive order. The seven-member independent Blue Ribbon Task Force is charged with developing the Delta Vision in 2007 and a strategic plan to carry out the vision in 2008. In their meetings, the Task Force members heard statements from scientists, stakeholders, government officials and the general public to assist in forming their vision. The Task Force also requested and received ideas and visions from the general public.

The five-member Delta Vision Committee is chaired by the Secretary for Resources; other members include the secretaries for the California Environmental Protection Agency; the Business, Transportation, and Housing Agency; the Department of Food and Agriculture; and the president of the Public Utilities Commission. These cabinet members are charged to report to the Governor about the vision and strategic plan in late 2008, and appoint the Stakeholder Coordination Group and the Delta Vision Science Advisors.

The Delta Vision process coordinates with and builds upon many of the ongoing but separate Delta planning efforts. Among these are:

- The Bay-Delta Conservation Plan
- Delta Risk Management Strategy
- Delta Regional Ecosystem Restoration Implementation Plan
- Ecosystem Restoration Program's Conservation Strategy
- Suisun Marsh Plan

The 43-member Stakeholder Coordination Group consists of representatives from all major interests using or living in California's Delta. With dedication and understanding, these women and men had 13 days of meetings to develop and refine nine principles, two emerging visions for California's Delta, and a list of near term actions. These emerging visions were first presented to the Task Force in August 2007, and contributed greatly to forming the vision. Many of the ideas presented in the Stakeholder Coordination Group will be more fully addressed during the strategic planning process.

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Two science advisors, Dr. Michael Healey and Dr. Jeffrey Mount, consult with the Task Force, the Delta Vision Committee and the Stakeholder Coordination Group and give advice about the scientific issues regarding the Delta. The science advisors formed an assessment team to review the scientific and technical issues found in the Stakeholder Coordination Group's two emerging visions and the eight external visions submitted by the general public.

Appendix II. Executive Order S-17-06

WHEREAS the Sacramento-San Joaquin Delta estuary, including Suisun Bay and Marsh (hereafter "Delta"), supports a unique and irreplaceable combination of environmental and economic resources. The Delta is a source of water for farmlands, growing communities and businesses and provides a unique estuarine habitat for many resident and migratory fish and birds, some listed as threatened or endangered species. It is an area that supports vital energy, transportation, communications and water facilities, and important agricultural, recreational and cultural resources. The Delta is of state and national significance and must be protected and managed effectively for the future well being of the people and the environment; and

WHEREAS the Delta is intersected by highways, roads, and utility lines critical to regional, state and interstate commerce and economy; and

WHEREAS the Delta is the hub of California's two largest water distribution systems, the federal Central Valley Project and State Water Project, and at least 7,000 other permitted water diverters have developed water supplies from the watershed feeding the Bay-Delta estuary, providing drinking water to about 23 million people and irrigation water to about 7 million acres of highly productive agricultural lands; and

WHEREAS recent events like the Lower Jones Tract levee failure and Hurricane Katrina, and recent findings that indicate a two in three chance of a major earthquake occurring in or near the Delta in the next fifty years, have raised awareness and concerns about the vulnerability of Delta levees. Failure of Delta levees can have devastating consequences on farms, communities, roads, railways, power and fuel transmission lines, water conveyance and quality, wildlife resources, and the local and state economy; and

WHEREAS threats such as an aging levee system, regional climate change, rising sea levels, seismic events and urbanization pose an imminent threat to the Delta; and

WHEREAS recent legislation, a number of planning efforts and scientists have affirmed that current uses and ecosystem health in the Delta are unsustainable over the long-term; and

WHEREAS there is growing recognition that prior Delta and Suisun strategic planning efforts have been too narrowly focused on only a few of the Delta's many uses and resources; and

WHEREAS the combined threats and changing conditions within the

system operations of the recent past. Likewise, water system reliability cannot be achieved if ecosystem problems continually disrupt deliveries. ***New storage and improved conveyance must be constructed to capture water at times that are least damaging to the environment*** and efficiently move it to areas and times of need. uses among all

Delta require immediate attention because of the potentially catastrophic environmental and economic consequences if timely action is not planned for and undertaken; and

WHEREAS the existing complex system of Delta governance has been criticized because 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.

NOW, THEREFORE, I, ARNOLD SCHWARZENEGGER, Governor of the State of California, by virtue of the power vested in me by the Constitution and statutes of the State of California, do hereby order effective immediately:

1. I hereby initiate the Delta Vision and establish an independent Blue Ribbon Task Force to develop a durable vision for sustainable management of the Delta. Making the Delta more sustainable will require a concerted, coordinated and creative response from leaders at all levels of government, stakeholders, academia and affected communities, and will require significant private and public partnerships and investments. The Delta Vision is designed to accomplish these goals:

(a) Meet the requirements of Assembly Bill 1200 (Water Code Sections 139.2 and 139.4), Assembly Bill 1803 (Water Code Section 79473) and SB 1574.

(b) Coordinate and build on the many ongoing but separate Delta planning efforts.

(c) Assess the risks and consequences to the Delta's many uses and resources in light of changing climatic, hydrologic, environmental, seismic, and land use conditions. This assessment will look at:

- The environment, including aquatic and terrestrial functions and biodiversity.
- Land use and land use patterns, including agriculture, urbanization, and housing.
- Transportation, including streets, roads, highways, waterways, and ship channels.
- Utilities, including aqueducts, pipelines, and gas/electric transmission corridors.
- Water supply and quality, municipal/industrial discharges and urban and agricultural runoff.
- Recreation and tourism, including boating, fishing, and hunting.

These levees are vulnerable to failure from earthquakes, floods, and structural decay. Multiple levee failures at one time in the Delta could flood dozens of islands, badly damage the ecosystem, and halt all water exports from the Delta for years. Levees are critical to the Delta's future. ***Over time, reliance on levees should be reduced.*** That does not mean abandoning the levees which define the Delta, but it does mean

Since any vision for the future Delta will be accomplished over a period of decades, the safety of those living in the Delta must be protected. ***New policies are needed to match levee designs to land uses*** behind the levees. For example, levees protecting urban areas will be designed to provide more protection than levees protecting agricultural land. Part of designing for resiliency is building a margin of safety for key

- Flood risk management, including levee maintenance.
- Emergency response.
- Local and state economies.

(d) Develop a program for sustainable management of the Delta's multiple uses, resources and ecosystem. Sustainable management of the Delta means managing 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. As part of the Delta Vision, priority functions and values will be identified, and measures necessary to provide long-term protection and management will be evaluated.

(e) Develop a Strategic Plan to implement findings and recommendations for public policy changes, public and private investment strategies, Delta-Suisun preparedness and emergency response plans for near-term catastrophic events, levee maintenance options, and how to monitor and report performance.

(f) Develop recommendations on institutional changes and funding mechanisms necessary for sustainable management of the Delta. Recommendations may include a discussion of oversight, land use and implementation authorities.

(g) Inform and be informed by current and future Delta planning decisions such as those pertaining to the CALFED Bay-Delta Program, Bay Delta Conservation Plan, Suisun Marsh Plan, Water Plan, updates of related General Plans, transportation and utilities infrastructure plans, integrated regional water management plans, and other resource plans.

2. The Secretary of the Resources Agency as chair, and the Secretaries of the Business, Transportation and Housing Agency, Department of Food and Agriculture and the California Environmental Protection Agency, along with the President of the Public Utilities Commission shall be the Delta Vision Committee, for the Delta Vision. They shall undertake the following:

(a) Explore entering into agreements with private and non-governmental organizations to receive funding for Delta Vision. In addition, the Director of Finance may also accept monetary and in kind contributions to support the activities of the Delta Vision.

(b) Create a Stakeholder Coordination Group to involve local government, stakeholders, scientists, engineers, and members of the public in this effort to develop a Delta Vision.

(c) Select Delta Science Advisors from diverse scientific disciplines to provide independent review and advice to the Blue Ribbon Task Force on technical, scientific, and engineering data, analyses, and reports.

(d) Report to the Governor and the Legislature by December 31, 2008 with recommendations for implementing the Delta Vision and Strategic Plan.

3. I will appoint the members of a Blue Ribbon Task Force to include diverse expertise and perspectives, policy and resource experts, strategic problem solvers, and individuals having successfully resolved multi-interest conflicts. The Task Force will seek input from a broad array of public officials, stakeholders, scientists, and engineers. The Task Force will prepare an independent public report that will be submitted to the Delta Vision Committee and Governor that sets forth its findings and recommendations on the sustainable management of the Delta by January 1, 2008 and a Strategic Plan to implement the Delta Vision by October 31, 2008.

4. Upon submittal of the Delta Vision Committee's recommendations to the Governor and Legislature, the Delta Vision initiative shall terminate unless extended by another executive order.

5. This order is not intended to create, and does not create, any right or benefit, whether substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, agents, or any other person.

IN WITNESS WHEREOF I have here unto set my hand and caused the Great Seal of the State of California to be affixed this 28th day of September 2006.