
MEMORANDUM

To: The Delta Vision Blue Ribbon Task Force

From: The Delta Vision Stakeholder Coordination Group

Subject: Submittal of Preliminary Recommendations Report

Date: August 21, 2007

Attached is the Preliminary Visions Recommendations Report from the Delta Vision Stakeholder Coordination Group (SCG). This report represents the results of six two-day meetings since March, along with significant time expended between meetings. During these meetings the SCG has focused on:

- 1) gaining a shared understanding of the major issues facing the Delta,
- 2) obtaining a broader understanding of the various interests and perspectives of the myriad individuals and organizations involved with the Delta
- 3) identifying major data and information needs critical to developing long-term visions for the Delta
- 4) initiating the process of developing visions which support the long-term sustainability of the Delta and the many “services” it provides.

While its charge states that consensus is not the goal of the SCG, and that multiple visions are acceptable, members recognize the value of working together to find long-lasting solutions to the Delta. SCG members broadly support the assertion that failure to act now is not an option, neither for those who live, work, play and depend on the Delta for their water supplies, nor for the Delta ecosystem itself. As such, SCG members have participated actively to identify both near- and long-term actions to address the issues facing the Delta, in the context of the values they have expressed.

SCG members broadly support a series of guiding principles and action steps towards sound decision-making detailed in the attached report. Two “emerging visions” and related recommendations are also outlined though they have not been endorsed by any particular organization. Most SCG members believe that more rigorous analysis of the emerging visions described, and their implications, is necessary before these visions can be fully developed and fairly evaluated.

The SCG is pleased to present its work to date to the Blue Ribbon Task Force, and to have the opportunity to discuss it with Task Force members. While this should be considered a “work-in-progress” it nonetheless represents the good faith efforts of the SCG to respond to its charge in a timely manner.



Delta Vision Stakeholder Coordination Group

Preliminary Recommendations Report

Prepared for the Delta Vision Blue Ribbon Task Force



August 21, 2007

This report was produced on behalf of the Delta Vision Stakeholder Coordination Group by the Center for Collaborative Policy at California State University – Sacramento, the University of California – Berkeley Delta Initiative, and Delta Vision staff.

August 21, 2007

Delta Vision Stakeholder Coordination Group (SCG)
Preliminary Recommendations Report to the
Blue Ribbon Task Force
August 2007

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1. INTRODUCTION

A. The Delta Vision Process

On September 28, 2006 Governor Arnold Schwarzenegger signed Executive Order S-17-06, establishing a Delta Vision Committee (Committee), a Blue Ribbon Task Force (Task Force) and a Stakeholder Coordination Group (SCG) to help develop a Delta vision and strategic plan. The Legislature passed measures targeting the Delta as well. Assembly Bill (AB) 1200 called for a risk analysis of Delta threats, and strategies for risk reduction. AB 1803 and Senate Bill (SB) 1574 called for the development of a long-term vision and strategic plan for the Delta.

Task Force recommendations on a vision for the Delta are due by January 2008, with an accompanying Strategic Plan by October 31, 2008. The Executive Order states the clear expectation that the Delta Vision Blue Ribbon Task Force will recommend a vision that establishes priorities among values and uses associated with the Delta and its resources.

B. The Charge to the SCG

The SCG is charged with developing alternative visions for a sustainable Delta and submitting those visions to the Task Force for consideration. Preliminary SCG recommendations are due to the Task Force by August 2007. This report summarizes the progress of the SCG to date in developing visions and related recommendations. The visions described in this report (and appendices) address the nine substantive topics identified by the Executive Order: environment, land use, infrastructure and utilities, transportation, water supply and quality, recreation and tourism, flood risk management, state and local economics, and emergency management. In addition, the charge states that visions should address the following four factors:

- The potential impacts of natural disasters, including floods, earthquakes, and global warming on the Delta;
- The current and future impact of residential, commercial and other development on the Delta;
- The ability of the Delta to continue to exist as a vital environmental resource for California;
- The ability of the Delta to continue to supply a statewide supply of water, of high quality, for residents, businesses, and agriculture.

The emerging visions described in this report suggest potential sets of management actions and physical changes in the Delta that address all of these vision components. These ideas must be subjected to rigorous analysis before being implemented, but represent promising possibilities for a future Delta that meets the requirements laid out in the Executive Order.

C. The Process for Developing SCG Visions

Developing Shared Understandings

The SCG held its first meeting in March 2007. Its March, April and May meetings focused in large part on creating a shared understanding of the Delta Vision initiative, critical Delta issues and perspectives of key stakeholders. This included:

- Clarifying the Delta Vision process and goals, and how the SCG would meet its charge

- Identifying and creating a mutual understanding of the key Delta issues
- Clarifying the process for creating visions responsive to the Executive Order
- Identifying information necessary for developing viable visions for the Delta
- Establishing working relationships among SCG members

Process of Developing Visions

The process of developing visions began in earnest at the SCG's June meeting, continuing at its July and August meetings. A template following the vision elements outlined in the Governor's Executive Order was used as a structure for developing visions.

At its May meeting, SCG members requested staff supporting their efforts to prepare "straw proposals" as the basis for beginning discussions about possible visions for the Delta based on discussions and information provided to date. At their June meeting, SCG members then divided into work groups based on their interest in the straw proposals presented. All members of the SCG gravitated into one of three groups. Two focused on developing specific visions for the Delta and the third focused on water operations and out-of-Delta strategies, issues that could potentially overlay any vision for the Delta.

To support the visioning process, staff prepared a series of maps and overlays containing relevant information that could be mapped or represented spatially. In June, SCG members used these maps and overlays to help identify the specific characteristics of two visions. They were similar in many ways, diverging primarily around conveyance options: a through-Delta fortified conveyance, and a through-Delta conveyance in conjunction with an "isolated" conveyance facility (see Chapter 5). Notably, however, both groups shared a common vision for the desired physical structure of the through-Delta conveyance component, and a specific adaptive implementation method for creating that structure, described in Chapter 3.

As these visions evolved, stakeholders and staff developed verbal descriptions and action items associated with both spatial and non-spatial elements of the visions. The visions were further refined by the small workgroups in the July and August meetings.

In the course of this activity, the SCG also crafted a set of recommendations for action-based decision making based on commonalities emerging from the independent activities of the small workgroups. These recommendations (see Chapter 3) revealed previously unsuspected levels of agreement among most parties about how to resolve certain key Delta issues, and now constitute a major component of the SCG's input to the Blue Ribbon Task Force.

September SCG Meeting

Given the timing of the Delta Vision initiative and availability of information considered important to the development of implementable and sustainable visions, the September SCG meeting remains a critical part of the visioning process. During August, several critical pieces of information will become available (though not necessarily finalized). These are likely to include:

- Refinement of Delta Risk Management Strategy (DRMS) Phase II "building blocks" and associated costs
- Completion of DRMS scenario modeling
- Completion of initial Bay Delta Conservation Plan (BDCP) modeling

- Potential hydrodynamic modeling under the auspices of the “Eco-Design team” created in response to a stakeholder request at the May meeting.

As such, the recommendations and emerging visions described in this report may undergo significant refinement or revision based on the analyses of this new information and their implications. The SCG anticipates the need to provide revised visions and recommendations during the September and/or October meetings of the Blue Ribbon Task Force.

Context for SCG Visions and Recommendations

Based on the work conducted in the June, July and August SCG meetings, this report was prepared to summarize the process and substantive outcomes of the SCG’s work to date. The SCG is particularly interested in communicating, however, that this set of emerging visions, while based on the best information available, requires more rigorous analysis before they can be considered fully developed.

While extensive data has been collected for many years, most SCG members feel that this information has not been synthesized or analyzed in a manner sufficient to support decision making and investment, and that there remain significant data gaps. Most are still looking for an objective basis for making recommendations about:

- conveyance, export levels and timing, and their impacts on the Delta ecosystem,
- how best to control undesirable non-native species,
- how to define a “desirable” Delta ecosystem,
- how to reconcile existing and emerging land use and development issues, and
- hydrodynamics and operations in and upstream of the Delta related to flood control, water quality and ecosystem impacts.

Most believe that additional information is needed on these topics, and others, before concrete and sustainable vision components and options can be clearly delineated. As such, these visions represent promising possibilities rather than settled recommendations.

Given this context, the “recommendations for action-based decision making” are a critical component of the SCG’s input to the Blue Ribbon Task Force, since they suggest specific methods for meeting the requirement for more information without delaying needed action to address the Delta’s pressing challenges. The emerging visions represent a series of concepts that incorporate these recommendations, and which SCG members believe may have merit as a basis for addressing the many longstanding and often controversial issues associated with the future of the Delta. SCG members believe that visions need to be grounded in the realities of what is technically possible in order to provide real long-term solutions for the Delta region and for California’s future.

Most SCG members have expressed the belief that significant progress is being made in working together to explore potential solutions to the many challenges facing the Delta. Indeed, the recognition of the uncertainties surrounding the Delta has itself been a basis for newfound, shared understanding among Delta stakeholders. The level of agreement so far achieved on what action-oriented steps to take to reduce that uncertainty (but not necessarily on what the Delta might actually look like after those steps) is a noteworthy accomplishment of the Delta Vision process to date.

The visions and recommendations will be modified by the SCG as more information becomes available during the remainder of the visioning effort in 2007 and during strategic planning in 2008.

2. GUIDING PRINCIPLES OF EMERGING VISIONS AND RECOMMENDATIONS

While the emerging visions being developed by the SCG are fairly detailed in response to the Governor's Executive Order, they are built on a series of much broader guiding principles. These reflect the major values of stakeholders and interest groups, and serve as the foundation for the visions and recommendations being developed by the SCG. At this stage in the process, some SCG members believe the primary focus should be on these key concepts behind the visions rather than the details of the emerging visions themselves.

The visions and recommendations described in later sections should be considered in the context of these principles, as they reflect overarching values that should inform the visioning process for the Delta. It is also anticipated that these guiding principles would be applied in any Delta vision in a manner consistent with each other.

These guiding principles were approved in this form in plenary session of the SCG. In no particular order of priority, they include:

- Given the inherent values of the Delta, its cultural uniqueness, and the economic and social networks it supports, visions for the future of the Delta should incorporate a sustainable Delta landform, including the levee system (i.e. the Delta should not be abandoned)
- The role of agriculture, fisheries, wildlife, recreation and tourism as major contributors to the economic vitality and quality of life of Delta communities, should be integrated into visions for the Delta
- The Delta and its ecosystem are regional, state and national treasures which should be protected and enhanced through any vision developed
- A role of the Delta in providing a reliable water supply to the San Joaquin Valley, Southern California, the Bay Area and the Delta region itself should be supported by visions
- Efforts to maintain, restore, and build terrestrial and aquatic habitat necessary to support desired population levels of native and desirable non-native species, including migratory species, should be supported by visions
- A commitment to avoiding disproportionate impacts and providing equitable benefits for low-income communities and communities of color should be incorporated into any vision for the Delta
- Given the many uncertainties associated with the complexity of the Delta ecosystem, pilot projects, long-term monitoring and an adaptive approach to implementation should be an integral part of any long-term vision for the Delta, building on the principle of "reversibility" in the early stages of assessing options
- Out-of-Delta actions to improve land and water management must be considered, and will likely be required, as part of the long-term vision for sustainability of the Delta and the Delta ecosystem

- Failure to act now, given the condition of and future risks to the Delta, is not an option.

Broad support exists for this “first tier” of guiding principles. It should be noted, however, that as refined visions and strategies emerge to address the long-term needs in the Delta, differing approaches to achieving these guiding principles are likely to be encountered.

3. RECOMMENDATIONS FOR ACTION-BASED DECISION MAKING

As noted above, a key task of the stakeholder involvement process to date has been developing a shared understanding of the state of knowledge about key Delta issues, and assessing what additional information may be required in order to craft visions that will withstand technical scrutiny. Several efforts have been undertaken to provide this information, or at least provide a status report on its collection. These include:

- SCG members identifying key science questions they believe need to be answered to make informed decisions about the future of the Delta
- Convening an “ecological geography” workshop with key Delta scientists (May 4)
- Convening an “In-Delta” workshop with local residents and farmers (May 9)
- Convening a science and information workshop for SCG members (June 7)
- Convening a science and information workshop on variable habitats (June 11)
- Meeting with key representatives of associated Delta studies (BDCP, ERP, DRMS) to identify available and missing information on identified topics
- Identifying specific data needs associated with emerging visions, among others activities (such as ongoing updates from various studies).

Throughout these activities, and in the course of developing the emerging visions, stakeholders have developed a shared understanding of the large uncertainties that still exist with respect to the Delta. Rather than recommending delaying action until such time as these uncertainties have been eliminated, however, SCG members have instead developed a series of steps that will build knowledge about the Delta through concrete near-term action to address its challenges.

Stakeholders have come to refer to these steps as “action-based decision making.” As envisioned by the SCG, this procedure calls for proposed physical alterations to occur in discrete steps so that effects can be carefully evaluated according to pre-determined criteria before proceeding to the next step. In this fashion, all of the following can occur simultaneously:

- Specific actions are taken immediately to address the Delta’s existing challenges,
- Knowledge is built about how the system works and responds to change, and
- A durable and equitable solution to the Delta’s challenges evolves over time

The SCG has developed a preliminary recommendation for action-based decision making for water conveyance and aquatic ecosystem management in the Delta. This recommendation was crafted by the SCG in plenary session, and is widely endorsed by SCG members.

In addition, the SCG has identified the information needed to develop action-based decision making methods in three other areas:

- Upstream floodplain management
- Water operations and out-of-Delta strategies
- Environmental justice

The present development or consideration of action-based decision making recommendations for these particular topics should not be construed as a prioritization of these issues above other critical issues in the Delta on the part of the stakeholders.

A. Water Conveyance and Aquatic Ecosystem Enhancement

The following process constitutes the SCG's recommendation on how to proceed with conveyance and aquatic ecosystem enhancements at this stage in the Delta Vision process. It is important to note:

- This summary in no way endorses any single approach to conveyance; rather it provides an approach to evaluating potential conveyance options
- While some members of the SCG oppose the use of an isolated conveyance facility as part of a potential dual conveyance strategy, they nonetheless support the concept that decisions about an isolated facility need to be objectively based.
- Only the evaluation (not the implementation) of an isolated facility is endorsed by the SCG-drafted language below. The two emerging visions described in Chapter 4 take different positions on the feasibility and desirability of an isolated facility as part of a potential dual conveyance solution, and the positions of individual SCG members differ as well.
- The underlying purpose of any approach to conveyance should be clearly articulated as part of the evaluation process
- A commensurate level of scrutiny should be applied to any potential approach to conveyance
- Ultimately, decisions about conveyance investments should be made in a transparent manner, with the basis for those decisions clearly articulated.
- No assumptions have been made, or are endorsed, concerning either increasing or decreasing water exports

The process as described below begins with the testing of a conveyance and aquatic ecosystem management option referred to by SCG members as "Middle River conveyance." This option would convey water intended for export from the Sacramento River to the Clifton Court Forebay by routing it through the Delta Cross-Channel, the Mokelumne River, the Middle River fork of the San Joaquin, and Victoria Canal. (For an illustration of the potential route, see p. 20)

Victoria Canal would then be siphoned under Old River, and the sloughs connecting Old River and Middle River would be fitted with operable barriers. This hydraulic separation of Middle and Old Rivers – if proven to work as envisioned – would allow Old River to be managed for aquatic habitat without suffering from pumping impacts or compromising the quality of export water in Middle River. In addition, the entrance to the Delta Cross-Channel (and perhaps other locations) would be fitted with fish screens to minimize or eliminate entrainment of fish.

The action-oriented decision making process is described by the SCG as follows:

1. If no fatal flaws are identified, obtain permits and ground-test the components of a Middle River Conveyance option, initially as a reversible experiment. In an open, transparent manner, analyze and refine the Middle River Conveyance option, including evaluation and appropriately staged implementation of:

- fish screens,
- gates and
- other “testable” components.

Develop performance standards that will be applicable to any conveyance option, including:

- ecosystem
- water supply
- environmental justice
- water quality
- fish populations.

The analyses should include a siphon to separate Old and Middle Rivers, under varying water operations and flows.

Conduct real-time monitoring, testing the components under varying flow conditions. At the end of each year, assess whether it should be continued as an experiment and maintain the ability to modify the design. If unacceptable impacts occur (based on the performance measures developed), stop the experiment and consider alterations for further testing. If results indicate the Middle River Conveyance is not likely to achieve its stated objectives, other potential through-Delta conveyance options should be similarly tested.

2. Simultaneously, in parallel with the through-Delta Middle River Conveyance options, begin detailed analyses of the isolated conveyance portion of a potential dual conveyance system, and related issues.

A number of important questions remain about dual conveyance that should be studied and answered, including but not limited to:

- impacts on in-Delta water supply and quality;
- impact on flood threats;
- security of an isolated facilities to earthquake, terrorism, flooding;
- robustness in the face of sea level rise;
- cost and fiscal impact on Delta levee maintenance and rehab, and flood response;
- security of Delta infrastructure and agricultural production;
- impact upon aquatic and terrestrial organisms;
- routing; and,
- costs and financing.

3. Future decisions about conveyance should be based on the results of these parallel analyses and other emerging information.

In addition, there are three other areas in which the SCG has identified information needed to develop recommendations for action-based decision making. These are presented below.

B. Upstream Floodplain Management

The SCG has crafted the following language on upstream floodplain management in plenary session:

More attention is needed statewide for expanding and coordinating floodplain management to assist with flood attenuation and enhance storage of surface runoff in groundwater aquifers for use during drier periods. This could help both attenuate flood risks in the Delta and provide additional water supply in current Delta export service areas during lower flow periods.

1. Review and assess the Natural Heritage Institute's floodplain and conjunctive use study (and other relevant studies) for the Central Valley, and assess applicability to emerging visions.
2. Analyze the capacity for a comprehensive, statewide system of floodplain management, floodwater infiltration, and groundwater recharge for the Central Valley.
3. If found to be technically viable, analyze and address institutional, legal, and operational barriers to this statewide program.
4. Clarify what DWR's local ground water basin program can contribute to this strategy.
5. Evaluate the potential benefits and impacts of a more aggressive approach to demand management and water re-use and recycling in areas served by the Delta and throughout the state.
6. Assess the impacts of statewide floodplain management, floodwater infiltration, and groundwater recharge on local communities' use of groundwater, especially in rural, lower income communities.
7. Gain a greater understanding of the energy implications associated with ground water pumping.
8. Assess the potential impacts on groundwater quality.

C. Water Operations and Out-Of-Delta Strategies

A series of operations and upstream, or "out-of-Delta," strategies have yet to be addressed in detail in the development of emerging visions from the Stakeholder Coordination Group. The following are intended to fill this gap, holding environmental, water quality, water supply and flood control in equal importance. (References to the Delta below include Suisun Marsh and are intended to encompass the relationship with San Francisco Bay). Specific actions and studies listed below may be opposed by individual SCG members, but this list represents a collective "best guess" on the information needed to create an action-based decision making program for water operations and out-of-Delta strategies.

- 1) Identify the desired characteristics (species, habitat, etc.) of a sustainable Delta ecosystem, and the changes in water inflows, outflows and in-Delta circulation needed to support that ecosystem (consistent with other beneficial uses).

The following are intended as tools to help achieve this objective:

- Identify how to adjust water operations to mimic more natural and beneficial flow patterns (hydrograph) to achieve desired goals, based on the natural capacity of each of the Delta's tributaries
- Build flexibility into operating protocols so rules allow the potential for unallocated water to be used to meet flow needs during critical periods for critical uses (e.g.,

ecosystem protection, water quality); one proposal suggests creating operating rules that allow one million ac-ft of water to be managed real time during critical periods

- Conduct analyses to determine the appropriate and needed size of the Environmental Water Account
 - Develop strategies to achieve coordinated planning and timing of releases from upstream reservoirs to meet multiple objectives, including reducing flood risks and pressures on the Delta ecosystem
 - As one potential regime to promote a sustainable ecosystem, assess the following proposed changes to (and associated implications of) the “hydroscape” of the Delta, and evaluate approaches to reshaping the hydrograph to achieve these outcomes:
 - Improve Delta outflow in late winter and spring of most years (i.e., move salinity interface downstream several km from current location except in driest years)
 - Improve Delta outflow in late summer and early fall of most years (i.e., maintain salinity interface at 80 km except in driest years)
 - Prevent large reverse flows to reduce negative ecosystem impacts (i.e., > 3000-5000 cfs) (improve export/inflow ratio to < 50 % in summer and winter export periods)
 - Improve Sacramento River flows in summer and fall
 - Improve San Joaquin flows during all months
- 2) Identify changes to the water management system most effective for providing environmental assets and reducing adverse impacts.
- Consider opportunities to facilitate willing seller water transfers
 - Identify strategies to reduce barriers to ground water development
 - Conduct a thorough evaluation of water needs from the Delta to identify where demand reductions might be possible and the array of options available to achieve reductions in specific locations or from specific sources
 - Identify where and how – upstream and downstream of the Delta – the greatest benefit could be derived from retiring land to augment flows for ecosystem health.
- 3) Identify available upstream flood management strategies that reduce flood impacts on the Delta and create other potential benefits (e.g. water supply, habitat), and evaluate the potential benefits and costs of those strategies.
- Evaluate how a flood plain management plan, which maximizes conjunctive use practices, would contribute to protecting or enhancing the beneficial uses of the Delta and affect other water operations
 - Develop strategies built on the concept of meeting a higher proportion of water diversions during high flow periods and a lower proportion during low flow periods (both ideally evaluated on an annual rather than seasonal or storm event basis); identify storage opportunities for flows captured during higher flow periods above and below the Delta
 - Evaluate how stormwater runoff upstream from the Delta, including urban, agricultural, public and undeveloped lands, affects both flood risk and water quality in the Delta, and identify options for reducing those impacts (including, for example, capture and reuse of stormwater)

- Identify where floodway improvements or creation of bypasses are possible to reduce flood risks and water quality impacts to the Delta
 - Consider enhancements to the bypass and weir system, and its operation, that could improve flood and/or water quality conditions in the Delta (e.g., relieving flood pressure on the Delta earlier during high water events, dredging sediments that are reducing the capacity of rivers, channels, sloughs and bypasses for use in building or maintaining levees)
 - Evaluate the potential for improving floodway, river, channel and bypass capacity to original capacity through dredging or other means
 - Identify the historic flood plains and floodways upstream from the Delta that are not already developed and which have capacity for flood attenuation and conjunctive use
 - Consider where floodway improvements or creation of bypasses may be utilized to reduce flood risks and water quality impacts to the Delta, and increase supply options and operational flexibility.
- 4) Identify appropriate in-Delta salinity regimes to protect urban, agricultural and ecosystem values under varying flow conditions and configurations.
- 5) Evaluate the extent to which existing state institutions effectively and transparently manage decision-making and implementation associated with large-scale hydrologic regime changes potentially needed to support desired biological conditions. Pending the results of this evaluation, identify and explore approaches to improving decision-making capacity and transparency.
- 6) Identify aspects of the current administrative, regulatory, legal, and institutional system that constrain opportunities to more effectively manage the system for ecosystem benefits.
- Identify constraints of the water rights system (both pre- and post-1914) on achieving Delta needs
 - Assess current application of Public Trust and other laws as applied to meeting Delta needs
 - Identify and evaluate the effectiveness of planning and decision making associated with ecosystem investments, and how they might be improved, including the requirement of performance standards for all investments
 - Identify potential incentives and disincentives – for both upstream and downstream diverters – to achieve specific target reductions (e.g., 25%) in demand, linked to specific benefits to the Delta
 - Develop strategies to achieve coordinated planning and timing of releases from upstream reservoirs to meet multiple objectives, including reducing flood risks and pressures on the Delta ecosystem
 - Evaluate changes needed to improve the ability to acquire water/water rights for environmental purposes
 - Evaluate how to improve flexibility/allocation of risk/use of unallocated water above baseline commitments (i.e., regulatory requirements for environment/water quality; contractual obligations for consumptive users)
 - Identify the contracting issues with and among state (and federal) agencies, which constrain effectiveness and develop approaches for improvement.

- 7) Identify the aspects of the current regulatory and institutional system (laws, enforcement, and monitoring) that constrain the achievement of desired water quality goals.
 - Clarify legal requirements, and responsible agencies, that specify water quality objectives in various parts of the Delta
 - Evaluate how stormwater runoff upstream from the Delta, including urban, agricultural, public and undeveloped lands areas, affects both flood risk and water quality in the Delta, and identify options for reducing those impacts
 - Identify how to reduce aquatic contamination – what are the unregulated pathways and regulatory deficiencies that negatively impact water quality
 - Evaluate the extent to which the current water quality management system is adequately achieving and maintaining water quality objectives; if not, what are the strategies and actions to improve the system.
- 8) Identify the aspects of the current regulatory, legal and institutional system that affect the achievement of desired water supply goals.

D. Environmental Justice

A number of important questions remain regarding the potential impacts and benefits to low-income communities and communities of color in the two emerging SCG visions. The following issues and questions, which do not represent an exhaustive list, should be studied:

1. Public health impacts resulting from mercury or other water contaminants in Delta waters
2. Impacts on drinking water quality, both surface and groundwater supplies
3. Impacts on potable drinking water availability due to any proposed changes in surface or groundwater rights or changes in current patterns of use, and the potential for communities currently lacking potable water to benefit from changes in Delta policies
4. Targeted assessments of risk to low-income communities and communities of color from catastrophic events and of the potential for these communities to benefit from emergency response planning
5. Effect on employment opportunities or other community resources or the potential to improve economic conditions including job creation, resulting from any policy changes of Delta Vision.
6. Any changes in the cost of domestic water and the impacts on affordability for low-income communities and communities of color
7. Ecosystem changes that may impact access to cultural resources, especially salmon and other river-related resources critical to maintaining particular Native American cultures.
8. The impacts on land-use, affordable housing and quality of life due to the proposed SCG visions.

A further list of data and information needs identified by the SCG is presented in Appendix C. The SCG may develop more recommendations on information needed for action-based decision making in future meetings.

4. EMERGING VISIONS

As has been noted, five “straw scenarios” were presented at the June SCG meeting that offered a wide range of potential Delta futures. Elements in these straw scenarios included different conveyance strategies, varying levels of urbanization, varying levels of levee investment, varying flood control strategies, and different packages of ecosystem enhancement measures. From this spectrum, stakeholders self-selected into only two vision working groups (plus a “water operations and upstream measures” working group), each of which developed a hybrid of two straw scenarios, including one common to both. These hybrids formed the basis of the two emerging visions presented below.

The similarities between the two emerging visions are significant. This in itself is a key outcome of the process to date, and will be discussed more fully in Chapter 5.

As has been noted, all vision elements listed below must be rigorously evaluated on technical, economic, social, and financial grounds before being implemented. Until such vetting occurs, SCG members feel that these emerging visions should be characterized as promising possibilities, rather than settled recommendations.

The language in the narratives below was crafted and approved by the individual vision working groups. The maps associated with each vision on pages 16 and 20 depict and describe certain important vision elements, but are not comprehensive representations of the visions. The full sets of vision components are presented in Appendix A and B (the latter forthcoming in September). A side-by-side view of the maps for easier direct comparison is presented in Appendix F.

A. Emerging Vision 1: “Flexible Delta”

The vision that follows is conceptual in nature and has many aspects yet to be defined. It has not been the subject of operational modeling or biological analysis.

Due to widespread uncertainty about many issues critical to the Delta’s future, this scenario envisions a “flexible Delta” that enables adaptive management for a wide range of objectives using reversible pilot projects.

Water conveyance continues to take place through the Delta, but is confined to an armored corridor that includes the South Fork of the Mokelumne River, the Middle River reach of the San Joaquin, and Victoria Canal (see map). The Old River reach of the San Joaquin is partially hydraulically separated from Middle River through the installation of operable gates on Woodward Canal, Railroad Cut, and Connection Slough. Old River is then managed for organic carbon production for the benefit of a range of aquatic species. This configuration would be implemented using the recommendations for action-based decision making described in Chapter 2.

In addition, water could be stored on Webb Tract and Bacon Island for release to Middle River for in-Delta use and export, or to Old River to augment flow and manage salinity and carbon levels. This stored water allows greater flexibility in the management of both the water system and the Delta ecosystem.

Water exports rates are to be linked to hydrologic and water quality conditions, and water delivered to the pumps may be of lower quantity but higher quality than today. In addition, some export water

will be re-circulated from the California Aqueduct to the San Joaquin River to improve water quality in the South Delta.

Operable gates along Old River, Frank's Tract, Grantline Canal, Upper Middle River and False River further enhance flexibility and enable experimentation and adaptive management involving salinity and invasive species control. These operable gates will enable salinity variations in the southwestern Delta. Holland Tract and Bouldin Island are managed for terrestrial and non-tidal wetland habitat.

This scenario also envisions major improvement of the Delta ecosystem through numerous other restoration and management actions, including creating new tidal marshes, restoring floodplain habitats, and creating new flood bypasses in three areas around the Delta. These actions provide nutrient and organic carbon production, protected rearing habitat, and other ecosystem services to native and desirable non-native aquatic species.

The Delta landscape and infrastructure is protected from mass island flooding with seismically resistant levees at numerous locations. A South Delta Infrastructure Corridor combining Highway 4, the BNSF Railroad, and the Mokelumne Aqueduct protects those systems from flooding. Highways 12, 160 and 220 are rebuilt on top of seismically resistant, 100-year flood levees. By securing the westernmost Delta islands with seismically resistant levees (potentially ring levees surrounding multiple islands), this vision reduces the chances of a systemic destabilization of the Delta landform or a "big gulp" of saltwater intruding into the Delta in the event of a major earthquake.

This vision also integrates the outcomes of the Suisun Marsh PEIR/EIS Plan, which is currently under development. The Plan will call for numerous elements, including the conversion of some existing managed wetland to tidal wetland habitats and the enhancement of managed wetlands, as well as the development of a funded exterior levee maintenance program.

Based on the Preferred Alternative selected in the PEIR/EIS, the conversion of managed wetlands in each of the four identified regions in the Plan, will total between 3,000 to 10,000 acres. Actions completed under this Plan will benefit a variety of species, ecosystem functions, and water quality. Levee improvements will protect managed wetland habitat, Delta water quality, and significant infrastructure such as natural gas production, the Southern Pacific Railroad tracks, petroleum pipelines, and other built structures.

In this vision, the Delta remains predominantly an agricultural region with some new urbanization in the secondary zone. In the westernmost islands, however, an assisted transition may be needed from irrigated agriculture to recreation, wildlife habitat, unirrigated agriculture or other land uses if salinity fluctuation impacts irrigated agriculture. The legacy towns along the Sacramento River are protected with seismically resistant ring levees. Growth in legacy towns will be based on historical growth patterns and be internally driven to enhance their social and economic sustainability.

Recreation and tourism investments are concentrated along Highways 12 and 160, the north Delta waterways, and in legacy towns. Fishing, hunting, birdwatching, and boating are all improved by ecosystem enhancements.


Figure 1. “Flexible Delta” Vision Map Key


- * Protect the existing island configuration but confine water conveyance to an armored channel along South Fork of Mokelumne and Middle River. Partially segregate the water conveyance system and aquatic habitat with operable gates connecting Old and Middle Rivers, and siphon the Victoria Canal under Old River to deliver water to the Clifton Court Forebay. Enhance habitat along Old River and in west Delta, potentially with setback and/or vegetated levees **(FD.1)**.
- * Rebuild Highways 12, 160, 84 and 220 on top of seismically safe, 100-year flood levees **(FD.2)**
- * Maintain Sacramento and Stockton ship channel levees to protect channel use **(FD.3)**
- * Protect Sherman, Twitchell, Brannan, Bradford, Webb, Jersey, Bethel, and Ryer Islands with seismically strong levees. Explore whether they are best protected by a continuous ring levees or individual island levees by conducting cost analysis and reviewing other considerations, such as boat access. **(FD.4)**
- * Provide seismically-safe flood protection for Delta legacy towns, Sacramento, W Sacramento, and Stockton area **(FD.5)**
- * Protect critical infrastructure, including the water conveyance channel, and a South Delta infrastructure corridor (including Highway 4, the Mokelumne Aqueduct, and the BNSF Railroad) with seismically safe levees **(FD.6)**
- * Recirculate some export water from California Aqueduct to San Joaquin River **(FD.7)**
- * Convert Webb Tract and Bacon Island to in-Delta water storage islands to create flexible management options **(FD.8)**
- * Extend Contra Costa intakes to Middle River to avoid Old River **(FD.9)**.
- * Restore floodplain along the Sacramento River (upstream of city of Sacramento) for the benefit of splittail and salmon, and to increase nutrient and carbon flows to Delta. Improve salmon spawning gravels upstream of Delta **(FD.10)**
- * Explore infiltration of floodwaters upstream to reduce Delta floods and replenish Central Valley groundwater **(FD.11)**
- * Manage Yolo Bypass for splittail and salmon, and to increase nutrient and carbon flows to Delta. Ensure that flood conveyance capacity of the Bypass, and water quality in the North Bay Aqueduct, are maintained **(FD.12)**
- * Enhance channel configuration and hydraulics of Elk, Sutter, and Steamboat Sloughs to provide alternative route for migratory fish that avoids Georgiana Slough and the Delta cross-channel **(FD.13)**
- * Improve hydraulic residence time and tidal exchange between Cache Slough and the Delta to contribute organic carbon, nutrients, and plankton to the Delta. Connect Cache Slough and Suisun Marsh hydrologically and terrestrially **(FD.14)**
- * Restore Mokelumne and Cosumnes River corridors. Enter into formal flood flow agreements with private landowners in the Stone Lakes area and other potential flood bypass areas. Explore opportunities to increase flood flow areas. **(FD.15)**
- * Convert managed wetlands into tidal wetlands as habitat restoration in Suisun Marsh (currently a brackish water habitat). Restore tidal action in each region of the Marsh, as detailed in vision narrative **(FD.16)**
- * Restore floodplains on the San Joaquin River, including flood bypasses on Paradise Cut and south of Vernalis **(FD.17)**
- * Restore tidal marsh on Decker Island, Dutch Slough, west end of Sherman Island, west bank of Sacramento River, and at other opportune sites in west Delta **(FD.18)**
- * Manage Bouldin Island and Holland Tract for terrestrial habitat **(FD.19)**
- * Focus new tourism and recreation along Hwy 160 and 12, in north Delta waterways, and in legacy towns. Permit legacy towns to grow at historic growth rates driven by internal, locally-driven needs to expand local economies **(FD.20)**.


“Flexible Delta”


Produced August 21, 2007


Legend


-  Element Described in Key


 Priority Levee


 Transition to Wildlife Habitat


 Channel Managed for Habitat


 Siphon



 Seasonal Floodplain


 Tidal Marsh


 Water Storage


 Water


 Freeways


 Urban
-  New Urban


 Operable Gate


 Infrastructure Corridor


 Recirculation Aqueduct


 Tidal Restoration Potential

 Suisun Marsh Region 1

 Suisun Marsh Region 2

 Suisun Marsh Region 3

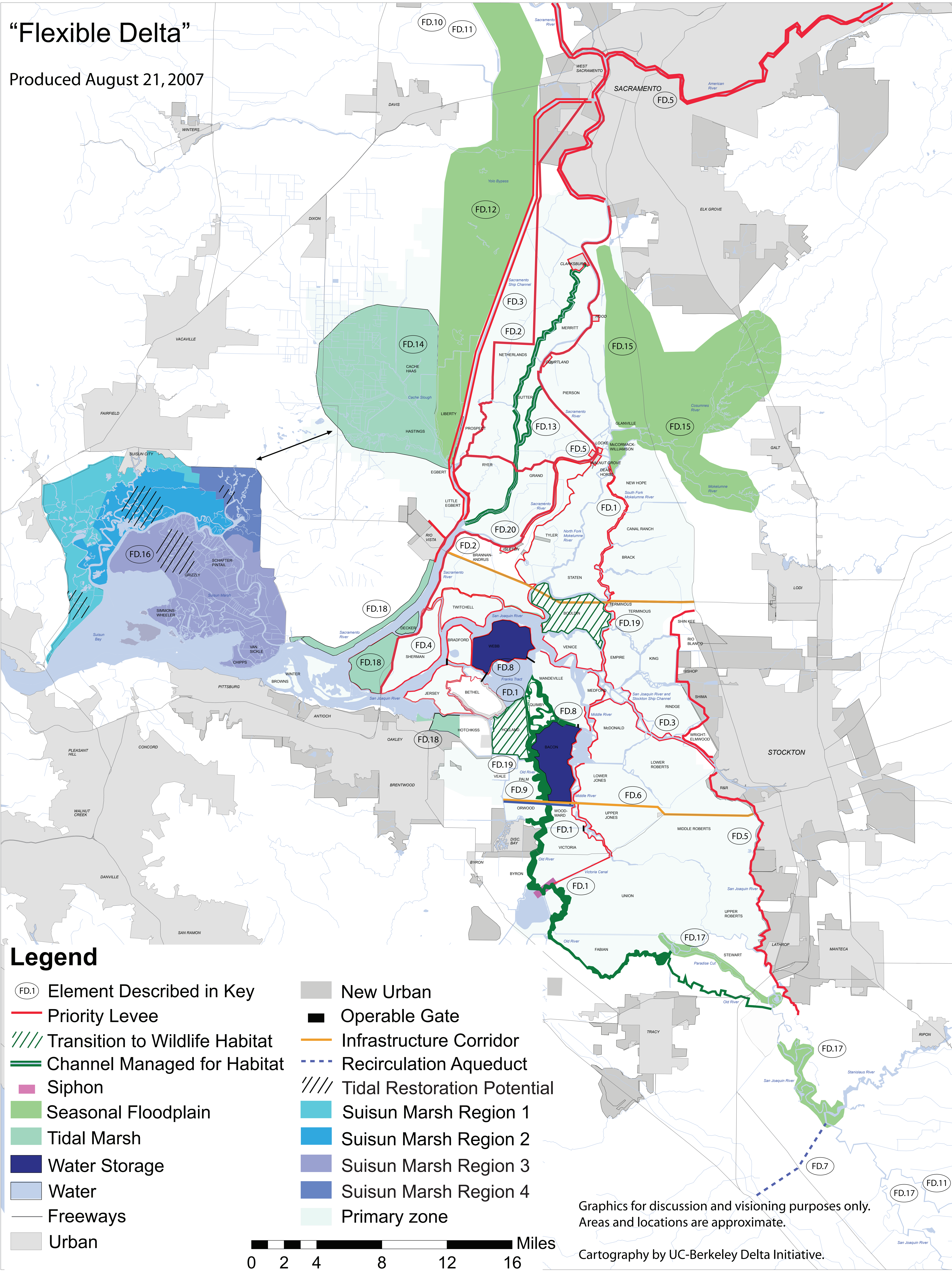
 Suisun Marsh Region 4

 Primary zone

0 2 4 8 12 16 Miles

Graphics for discussion and visioning purposes only.
Areas and locations are approximate.

Cartography by UC-Berkeley Delta Initiative.



B. Emerging Vision 2: “Resilient Adaptive Delta”

The Resilient Adaptive Delta Vision foresees a Delta that is a mixture of thriving ecosystems, sustainable agricultural and recreational economies, prudent levee investments, secure infrastructure, and reliable, high-quality water supply.

At the core of this vision is an aggressive two-track program of improvements designed to enhance the quality and reliability of water exports, reduce fish conflicts, and enhance the Delta ecosystem for terrestrial and aquatic species, while preserving long-term sustainable in-Delta agriculture. The first track has three components:

1. Implement a robust program of appropriately sequenced channel barriers, fish screens, levee improvements, and a channel siphon that directs flows in selected conveyance channels (North and South Forks of the Mokelumne River, Middle River, and Victoria Canal, collectively referred to as “Middle River Conveyance”) directly to the export pumps
2. Isolate Old River from the pumps, and manage it for aquatic habitat, to achieve the following benefits:
 - eliminate entrainment of Delta smelt and other fish from the west Delta and Old River
 - provide passage for salmon and other migratory fish to the San Joaquin River
 - greatly reduce conflicts between water system operations and fish populations
 - allow opportunities for experimental and adaptive ecosystem management without compromising export water quality
3. Implement a prudent program of emergency preparedness, including pre-positioning of stockpiled materials, evacuation planning, and a host of other necessary measures

The second track is a simultaneous aggressive program of engineering design studies, feasibility studies, hydrodynamic modeling and other relevant investigation into the benefits, costs and impacts of an isolated water conveyance facility.

In parallel with these studies, discussions among relevant parties about potential financing, sizing, operations, and assurances associated with such a facility would proceed. Additionally, this evaluation will be integrated with concurrent studies of flood management, reservoir re-operation, and potential for surface and groundwater storage both north and south of the Delta, in order to understand the relationship between these out-of-Delta issues and the costs and benefits of all in-Delta conveyance options (including an isolated facility). Depending upon the outcome of these studies and real-world observation, the ultimate conveyance strategy envisioned here will involve both the Middle River Conveyance and an isolated facility.

This “action-oriented decision making” approach combines decisive action with recognition of how much uncertainty there is about the consequences of any major action in the Delta. The program of improvements requires rigorous examination of the effects of each action to ensure that effects upon ecosystem processes, water supply reliability, and water quality (for all end users) are understood before proceeding to the next step.

The Stakeholder Coordination Group achieved widespread agreement on the recommendation for action-based decision making on water conveyance and aquatic ecosystem discussed in Chapter 2

above. A more detailed example of such a process, developed by the Resilient Adaptive Delta Vision group, might proceed as follows:

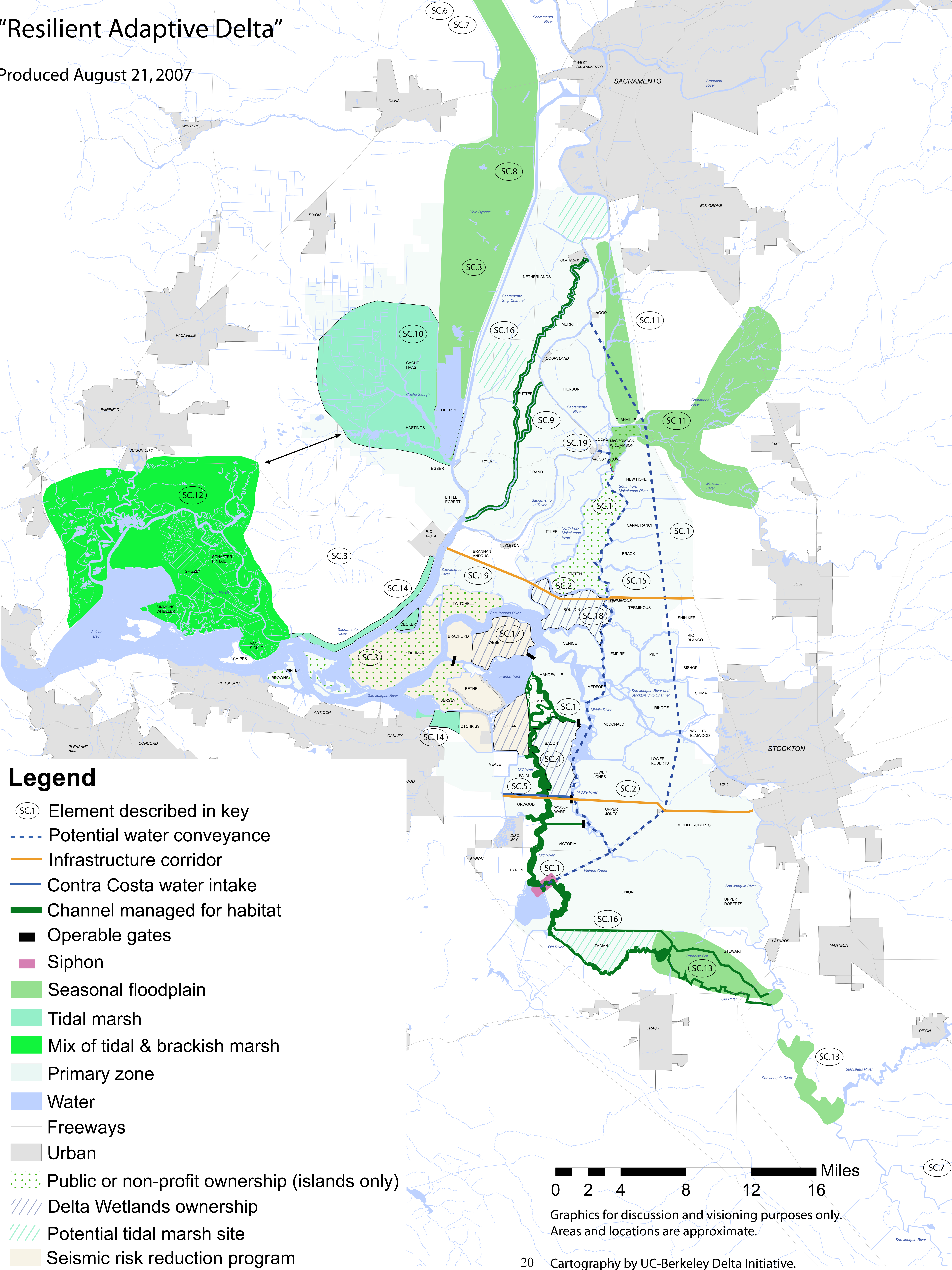
1. Beginning immediately, pre-position materials necessary for emergency response throughout the Delta, and implement a prudent program of emergency preparedness.
2. Beginning immediately, conduct engineering design studies, feasibility studies, hydrodynamic modeling, cost-benefit analyses, and other relevant investigations of an isolated water conveyance facility.
3. Beginning immediately, conduct reconnaissance-level studies (e.g. particle studies, hydrodynamic modeling, etc.) to examine hypotheses about the ecosystem, water supply reliability, and water quality effects of hydraulic separation of Old and Middle River, including the gating of channels between the two rivers, the siphoning of Victoria Canal under Old River, and the installation of fish screens on the Delta Cross-Channel and Georgiana Slough.
4. If validated by those studies, create temporary and reversible barriers in Woodward Canal, Railroad Cut, and Connection Slough, and install fish screens on the Delta Cross-Channel and Georgiana Slough.
5. Aggressively monitor the impacts (including costs and benefits) of the barriers and fish screens on water supply reliability, water quality, ecosystem conditions, and recreational activity.
6. If overall effects observed by this monitoring are on balance desirable, construct operable gates on these channels in place of the temporary barriers. (If not, remove the barriers and fish screens.) In addition, install the siphon and aggressively monitor its impacts on water supply reliability, water quality, and ecosystem conditions.
7. If overall effects observed by the siphon monitoring are on balance desirable, use the operable gates to continue ongoing experimentation on optimal hydraulic relationship between Old and Middle River for ecosystem productivity, water supply reliability, and water quality for all end users. Extend Contra Costa Water District and East Contra Costa Irrigation District and nearby island intakes to Middle River.
8. Examine the costs and benefits of fortifying specifically identified levee reaches along the Middle River Conveyance corridor to achieve various degrees of water supply reliability with respect to seismic, flood, and levee failure risks, and compare these to the costs and benefits of only pre-positioning emergency response materials without fortifying the conveyance corridor.
9. Simultaneous to above, explore the potential for additional groundwater and surface water storage, demand reduction, water trading, flood management, reservoir re-operation, conjunctive use, and other actions to mitigate effects of global warming-induced snowpack reductions on year-round availability of water for export and for environmental uses.
10. Based on all of the above, identify and implement the conveyance strategy that achieves the best package of water supply reliability, water quality, and ecosystem benefits relative to cost.

Figure 2. “Resilient Adaptive Delta” Map Key

- * Conduct an action-oriented staged implementation of water conveyance along South Fork of Mokelumne and Middle River. Experimentally segregate the water conveyance system and aquatic habitat by gating connections between Old and Middle Rivers, and siphoning the Victoria Canal under Old River. Manage Old River for aquatic habitat. Simultaneously intensively study design, costs and benefits of isolated conveyance channel. See vision description for more detail **(SC.1)**.
- * Improve seismic and flood safety for Highway 4, the Mokelumne Aqueduct, and the BNSF Railroad by placing in South Delta infrastructure corridor. Improve seismic and flood safety for Highway 12. Explore potential recreation and habitat benefits of setback levees underneath highways **(SC.2)**
- * Implement seismic risk reduction program on eight western islands. Explore use of cross-levees on island interiors. Explore dredging of Yolo Bypass and quarrying of Montezuma Hills to rebuild Sherman Island to sea level **(SC.3)**.
- * Enhance habitat along Old River and in west Delta with setback and/or vegetated levees. **(SC.4)**.
- * Extend Contra Costa Water District and East Contra Costa Irrigation District intakes to Middle River **(SC.5)**.
- * Restore floodplain along the Sacramento River (upstream of city of Sacramento) for the benefit of splittail and salmon, and to increase nutrient and organic carbon flows to Delta. Improve salmon spawning gravels upstream **(SC.6)**.
- * Explore infiltration of floodwaters upstream to reduce Delta flood risk and replenish Central Valley groundwater **(SC.7)**
- * Manage Yolo Bypass for splittail and salmon, and to increase nutrient and carbon flows to Delta **(SC.8)**
- * Enhance channel configuration and hydraulics of Elk, Sutter, and Steamboat Sloughs to provide alternative route for migratory fish that avoids Georgiana Slough and the Delta cross-channel **(SC.9)**
- * Improve hydraulic residence time and tidal exchange between Cache Slough and the Delta to contribute organic carbon, nutrients, and plankton to the Delta, for the benefit of Delta smelt among others. Create a hydrologic and terrestrial connection between Cache Slough and Suisun Marsh **(SC.10)**
- * Restore Mokelumne/Cosumnes floodplain and McCormack Williamson Tract. Create Stone Lakes flood bypass **(SC.11)**
- * Convert managed wetlands into tidal wetlands as habitat restoration in Suisun Marsh (currently a brackish water habitat). Restore tidal action in each region of the Marsh, as detailed in vision narrative **(SC.12)**.
- * Restore seasonal floodplain on lower San Joaquin River, including flood bypass on Paradise Cut **(SC.13)**
- * Restore tidal marsh on Decker Island, Dutch Slough, and west bank of Sacramento River **(SC.14)**
- * Purchase terrestrial habitat and wetlands easements from willing landowners. Maintain working landscapes that also serve ecological and recreational enhancement goals. Explore trail development in eastern Delta uplands **(SC.15)**
- * Explore creation of tidal habitats on selected portions of Fabian Tract and Netherlands Tract **(SC.16)**.
- * Explore controlled inundation of selected western Delta islands (especially Webb and Bacon) for operational flexibility in water management, ecosystem management and levee failure risk reduction **(SC.17)**.
- * Explore creation of perennial, non-tidal habitats on Bouldin Island, Holland Tract and elsewhere **(SC.18)**
- * Concentrate tourism and recreation investments along Hwys 160 and 12, in north Delta waterways, and in legacy towns. Permit historic sustainable growth to allow for socially and economically viable communities in legacy towns **(SC.19)**.

"Resilient Adaptive Delta"

Produced August 21, 2007



To complement the above strategies, an aggressive set of ecosystem restoration actions is envisioned to enhance aquatic and terrestrial habitats throughout the Delta. While there is a large universe of possible restoration actions that merit analysis and possible implementation, the vision sees the following as the most promising potential actions:

- Tidal marsh restoration in Cache Slough, Suisun Marsh, Decker Island and Dutch Slough
- Management of the Yolo Bypass for fish habitat as well as flood attenuation
- Enhancement or re-creation of seasonal floodplains on the Mokelumne, Cosumnes, and San Joaquin Rivers, and the creation of a San Joaquin River flood bypass
- Enhancement of channel configuration and hydraulics of Elk, Sutter and Steamboat Sloughs, to provide migratory fish passage
- Acquisition of habitat easements for migratory birds and other key terrestrial species from willing landowners throughout the Delta

With respect to the Suisun Marsh, this vision integrates the outcomes of the Suisun Marsh PEIR/EIS Plan, which is currently under development. The Plan will call for numerous elements, including the conversion of some existing managed wetland to tidal wetland habitats and the enhancement of managed wetlands, as well as the development of a funded exterior levee maintenance program.

Based on the Preferred Alternative selected in the PEIR/EIS, the conversion of managed wetlands in each of the four identified regions in the Plan, will total between 3,000 to 10,000 acres. Actions completed under this Plan will benefit a variety of species, ecosystem functions, and water quality. Levee improvements will protect managed wetland habitat, Delta water quality, and significant infrastructure such as natural gas production, the Southern Pacific Railroad tracks, petroleum pipelines, and other built structures.

This vision also recognizes that out-of-Delta conditions affect the Delta dramatically, and that any lasting solution will require action outside the region that reduces stressors on the Delta itself. This vision therefore calls for an immediate and rigorous investigation into the statewide water supply challenges posed by the projected loss of snowpack under regional climate change. All options for new water supply, water storage (both surface and groundwater), conjunctive use, reservoir re-operation and demand reduction should be explored so that implementation of desirable strategies can begin in a timely manner.

In addition, the prospect of more intense rainfall and more frequent large floods are significant management challenges for the Delta. Upstream flood attenuation (including increased infiltration, reservoir re-operation, conjunctive re-use, stormwater management, expanded floodplains and flood bypasses, and possible additional surface storage) is therefore a key component of a sustainable Delta.

The Delta landscape in this vision is dominated by protected habitats and sustainable farming, and serves as a prime recreation destination. This vision recommends that the definition of the primary and secondary zones be re-evaluated to determine whether they are consistent with this ideal. In the primary zone, residential development should be permitted in (and restricted to) legacy towns and other flood-safe areas necessary to specifically support sustainable agriculture, tourist and recreational economies. In the secondary zone, the vision should include a program of flood safety regulation and financial incentives to prevent residential subdivisions in deep floodplains and potential floodways.

A seismic risk reduction program for the eight western Delta islands, including internal cross-levees, subsidence reversal, and levee strengthening, is also necessary. These islands are of special importance to the entire region because their inundation would:

- Destabilize the remaining Delta landform
- Allow saltwater intrusion deep into the central Delta, compromising water quality for local farmers and possibly for the export projects
- Likely reduce habitat quality for desirable aquatic species
- Harm the agricultural economy and local tax base
- Damage or endanger certain critical infrastructure systems, such as Highway 160, regional electricity transmission lines, and major natural gas fields and pipelines.

The Delta presents special challenges to infrastructure development, but what is there should be consolidated and protected. In this vision, a South Delta Infrastructure Corridor combining Highway 4, the Burlington Northern and Santa Fe Railroad, and the Mokelumne Aqueduct protects these systems from flooding.

Overall, this vision, in a statewide context, foresees a Delta that:

- serves as a key component of California's water supply system
- is not substantially degraded by runoff and pollution from upstream
- contains sustainable populations of native, sport and commercial fish
- has a healthy local and regional economy
- continues to develop its unique cultural and regional identity
- is a key link in the Pacific Flyway for migratory birds
- is a prime recreation area for all Californians
- is a prime area for sustainable and wildlife-friendly agriculture (including carbon sequestration farming) under responsible public and private stewardship

5. COMPARISON BETWEEN VISIONS

Despite the important difference of opinion between the two emerging visions with respect to the potential desirability of an isolated facility to accompany the Middle River Conveyance, the two emerging visions are primarily characterized by broad areas of similarity. A comparison between the two visions can be viewed in terms of several broad themes, discussed below. Summary lists of similarities and differences are presented on pages 28 and 30.

In addition, the SCG is in the process of identifying common elements that would be integrated into all visions emanating from the SCG. This brief list of common elements, which will be expanded on at the September meeting, is identified in Appendix D.

A. Uncertainty

Most fundamentally, both emerging visions represent a response to the uncertainty that pervades decision-making about the Delta. As this report has already noted, SCG members collectively feel that critical information is currently lacking on numerous pivotal subjects, including the impact of particular conveyance strategies on the ecosystem and water quality for various parties, the ecosystem conditions necessary to recover threatened native species and discourage destructive invasive species, and many others. Implementation of these emerging visions should involve caution and humility, given how much is not understood about how the Delta works now, how it will work in the future given the drivers of change, and how it will react to any proposed changes.

Both the Flexible Delta Vision and the Resilient Adaptive Delta Vision recognize the reality of this uncertainty, and indeed employ it as an organizing principle. Rather than lurch toward a sudden, irreversible change to the Delta, with unknown consequences, these visions foresee a purposeful but careful series of steps that will implement needed changes to the water conveyance and aquatic ecosystem as they prove themselves worthy in real-world applications. Neither vision sees it as advisable to make irreversible structural changes to the Delta immediately, in the absence of better information. Both visions also emphasize that all suggested changes to the Delta must be subjected to thorough technical vetting before being implemented, and should be evaluated for their effects on the ecosystem, water supply reliability, and water quality for all end users.

B. Adaptive implementation of Middle River/Old River separation

Both visions assert that some degree of separation between the water conveyance and the aquatic habitat of the Delta is a promising idea worthy of at least experimental implementation. Both visions suggest exploring the Middle River conveyance strategy (as described in Chapter 3), and the hydraulic separation of Middle and Old Rivers, as a key part of Delta water conveyance and aquatic ecosystem improvements. In the Resilient Adaptive vision, iterative decision-making will decide whether this Middle River system should be joined by an isolated facility to form a dual conveyance system, whereas the Flexible Delta vision does not include an isolated facility.

In addition to being implemented in an adaptive manner, the resulting physical configuration would itself be amenable to ongoing experimentation and adaptive management. With operable channel gates on the sloughs connecting Middle and Old River, dynamic ecosystem management in response to evolving conditions and knowledge will be possible. Hydraulic and ecosystem conditions (such as

salinity, water temperature, flow direction and velocity, etc) in Old River could be manipulated without impacting the quality or reliability of water supply to the export projects or Contra Costa County.

In either vision, Old River would be separated from the effects of export pumping, making it a refuge for Delta smelt and other aquatic organisms that suffer from entrainment or reverse flows. In addition, because of the gating of the sloughs between the rivers, much of the west Delta (e.g. Franks Tract, Big Break, the lowest reaches of both rivers) would be insulated from pumping effects as well. Any fish in those areas would have to travel a very long and indirect path to the pumps.

The separation between the rivers – if proven to provide the benefits claimed – would also enhance water supply reliability. With many fewer (or no) fish being entrained in the pumps, water exports would be much less vulnerable to pumping shutdowns caused by legal and regulatory conflicts.

Within this context of similarity, there are some differences in the specifics of water export regimes between the two visions in addition to the potential isolated facility. Flexible Delta calls for the use of water storage islands to allow greater flexibility in the management of freshwater flows in the Delta for various purposes, such as local water supply, export water supply, ecosystem management, or salinity repulsion.

Flexible Delta also calls for a return aqueduct from the California Aqueduct to the San Joaquin River to introduce higher quality export water into the San Joaquin slightly upstream of the Delta. This would improve environmental conditions in the river and enhance water quality for south Delta and central Delta irrigators. The Flexible Delta also calls for tying export levels to in-Delta hydrologic and water quality conditions. The Resilient Adaptive Delta vision makes no predetermination and leaves those specifics to the operational and regulatory requirements in place at any given time.

C. Ecosystem enhancement actions

Both visions embrace a similar menu of promising ecosystem enhancement measures, including:

- Upstream expansion of Sacramento River floodplain and improvement of migratory fish habitat
- Management of Yolo Bypass for habitat value in addition to flood bypass functions
- Tidal marsh creation at Cache Slough, and hydraulic and terrestrial connection of Cache Slough to Suisun Marsh
- Restoration of floodplains on Cosumnes and Mokelumne Rivers, including on McCormack-Williamson Tract
- Channel improvements for migratory fish in Elk Slough, Sutter Slough, and Steamboat Slough
- Tidal marsh creation at Decker Island, Dutch Slough, and along the west bank of the Sacramento River below Rio Vista
- Floodplain restoration on the San Joaquin River, and flood bypass creation in the vicinity of Paradise Cut

As this list indicates, both visions attempt to place habitat “eggs” in multiple “baskets,” with tidal marsh, seasonal floodplain, flood bypass, in-stream habitat, and terrestrial habitat enhancements each

in multiple locations. This is especially important in a region like the Delta where the drivers of change may have sudden and unpredictable consequences for any particular area.

Viewed as a whole, these measures also show that ecosystem enhancement and restoration in the Delta likely will take place predominantly at the geographical periphery of the region – even outside the secondary zone in many cases. Given the subsidence of land throughout the Delta primary zone, large-scale tidal marsh restoration is much more practical at places like Cache Slough, which is roughly at sea level and still experiences a large tidal influence.

Likewise, the seasonal floodplains of the Delta’s tributary rivers are key habitats for native fish. Both visions propose restoring portions of these floodplains and managing human-created flood bypasses to provide many of the same habitat benefits. These “peripheral” changes not only provide habitat directly, but also produce organic carbon that can be carried into the interior Delta to enhance food chains there.

This is not to suggest that the Delta primary zone is unimportant. Channel improvements in Elk, Sutter and Steamboat Sloughs are intended to allow fish to migrate without ever interacting with the Delta cross-channel and the proposed conveyance system. The aforementioned isolation of Old River from the pumps is meant to accomplish the same thing for migrants on the San Joaquin system.

Last but not least, both visions encourage the expansion of terrestrial habitat throughout the primary zone through acquisition of easements from willing sellers. This habitat may take the form of seasonal wetlands, riparian woodlands, or farmland that is managed for the benefit of migratory birds.

The proposed ecosystem enhancements will also permit staging. For example, tidal marsh restoration on Dutch Slough – a project that is already well along the path to implementation – will be a critical learning opportunity. Lessons gleaned from that experience will then be useful for larger scale restorations in Cache Slough, Suisun Marsh and elsewhere.

Differences in ecosystem recommendations are comparatively minor. The Resilient Adaptive Delta Vision sees possible merit in some variation of the Flexible Delta proposal to create water storage islands on Bacon Island and Webb Tract, and habitat islands on Bouldin Island and Holland Tract, but urges further study before implementation. The Resilient Adaptive Delta also calls for feasibility study of tidal wetlands creation on Fabian Tract, Netherlands Tract, and on the edges of west Delta islands (using setback levees). Flexible Delta foresees tidal marsh creation on the western half of Sherman Island.

D. Improving flood risk management for towns, west Delta, and infrastructure

While the visions differ in the degree of specificity with which they call for levee improvements, they draw some significant common conclusions. First, both visions endorse the key idea of reducing river-flood pressure on Delta levees by expanding upstream infiltration of floodwaters, and by creating new flood bypasses on Paradise Cut and in the Stone Lakes region.

Second, both visions agree that the western Delta islands, especially Sherman Island, merit improved seismic and flood security. Inundation of these islands would be destabilizing to the remaining Delta landform and would compromise water quality throughout the Delta. Flexible Delta calls for securing these islands either through strengthening individual island levees or through creating

Dutch-style “polder” ring levees that encompass multiple islands (and gate the interior channels). Resilient Adaptive Delta calls for a seismic risk reduction program that involves internal cross-levees and subsidence reversal (potentially using material from the Montezuma Hills and the Yolo Bypass) in addition to levee strengthening.

Both visions assert that the critical infrastructure that passes through the Delta should receive improved seismic and flood security. In the south Delta, both visions call for a consolidated infrastructure corridor that includes Highway 4, the Mokelumne Aqueduct, and the Burlington Northern Santa Fe Railroad. In the north Delta, enhanced seismic and flood security for Highways 12 and 160 is also envisioned. Regional electricity and natural gas infrastructure happens to be concentrated on west Delta islands, where increased protection is already desirable for other reasons (see above).

The Flexible Delta Vision calls for additional seismically resistant levee investment in a number of other infrastructure systems, including the Middle River water conveyance channel, the Stockton ship channel, and Highways 160 and 220. While the Resilient Adaptive Delta does not necessarily oppose this, it calls for more rigorous examination of the costs and benefits before committing to these large investments. Finally, both visions assert that the Sacramento River legacy towns require improved seismic and flood security.

E. Maintaining the Delta as an agricultural and recreational region

The SCG is nearly unanimous in its belief that there should not be substantial new urbanization in the primary zone, except in the Sacramento River legacy towns. These towns may be permitted to grow in ways consistent with their historic internal needs and with their economic and social sustainability. The Resilient Adaptive Delta vision also calls for prohibiting residential subdivisions in deep floodplains and potential floodways in the secondary zone. The Flexible Delta calls for the use of buffers between any new secondary zone urbanization and agricultural or habitat areas.

The remaining Delta landscape, in both visions, remains dominated by agriculture and terrestrial habitat. Both visions support economically viable and sustainable Delta agriculture and encourage the adoption of carbon sequestration farming, wildlife-friendly farming, and subsidence-reversal farming wherever possible and appropriate. However, the Flexible Delta Vision foresees a probable need to transition away from irrigated agriculture in the west Delta, due to the difficulty of assuring appropriate water quality over the long term.

Delta recreation and tourism will likely grow in size and economic importance as the population of northern California increases. New investments in recreational and tourist facilities should be concentrated in the legacy towns, along North Delta waterways, and close to highways. Both visions foresee that the experiential quality of outdoor recreation – including hunting, fishing, birdwatching, biking, boating and other watersports – will likely improve substantially along with the enhancements to the ecosystem described above. Both visions call for new channel gates to be operable (or contain boat locks) so that recreational boating is not excluded from areas appropriate for cruising.

F. Other specific common elements

Finally, the visions also take similar approaches to upstream and out-of-Delta issues, including statewide water supply and conveyance issues, as discussed in Chapter 3 above. For example, understanding the extent to which a possible Central Valley groundwater infiltration strategy can ameliorate flooding pressures on the Delta will be important to making rational levee investment decisions. Similarly, conveyance decisions should reflect ongoing analysis of the state's water supply needs, along with assessing what role new storage could play in overall water supply, water quality, ecosystem and flood management.

In addition, three other common elements have been explicitly identified by the SCG for integration into both emerging visions. The full text of these elements is presented in Appendix D. More common elements may be developed at future SCG meetings, at which time the full set can be incorporated into the vision descriptions.

Table 1.

Summary list of key similarities between visions

As noted in report, vision elements listed below must be rigorously evaluated on technical, economic, social, and financial grounds before being implemented. SCG members feel that these are promising possibilities, rather than settled recommendations.

Implementation process

1. Use action-based decision making to determine best water conveyance and ecosystem management strategy
2. Develop information necessary to conduct action-based decision making for upstream floodplain management, water operations and upstream measures, and environmental justice, and potentially other issues.

Water supply and quality

1. Conveyance through Mokelumne, Middle River, and Victoria Canal (if shown to improve water supply reliability, water quality, and ecosystem conditions)
2. Old River isolated from pumping effects and managed for aquatic habitat
3. Hydraulic separation of Middle and Old River (at least on experimental basis) through channel barriers and the siphoning of Victoria Canal under Old River
4. Moving Contra Costa water intakes to Middle River

Environment

1. Flexible adaptive management in Old River and west Delta for benefit of key aquatic species and reduction of invasives
2. Sacramento River – upstream expansion of floodplain and improvement of habitat
3. Yolo Bypass – management for habitat value in addition to flood bypass functions
4. Cache Slough – tidal marsh creation and connection to Suisun Marsh
5. Mokelumne/Cosumnes Rivers – restoration of floodplains
6. McCormack-Williamson Tract – floodplain restoration
7. Elk Slough, Sutter Slough, Steamboat Slough – channel improvements for migratory fish
8. Decker Island, Dutch Slough, Sacramento River below Rio Vista – tidal marsh creation
9. San Joaquin River – floodplain restoration and flood bypass in vicinity of Paradise Cut
10. Suisun Marsh – implementation of tidal marsh restoration according to PEIR/PEIS plan
11. Explicit commitment to recovery and long-term sustainability of fish, wildlife, and waterfowl

Flood risk management

1. Upstream infiltration of floodwaters to the extent feasible
2. Flood bypass in vicinity of Paradise Cut
3. Flood bypass in Stone Lakes region
4. Increased seismic and flood security for west Delta islands (varying means)
5. Increased seismic and flood security for legacy towns

Transportation, utilities, and infrastructure

1. South Delta infrastructure corridor – Highway 4, Mokelumne Aqueduct, BNSF Railroad combined into one secure corridor
2. Increased seismic and flood security for Highway 12

3. Increased seismic and flood security for electricity and natural gas infrastructure through protection of west Delta islands; as-needed repairs elsewhere

Land use

1. Permit growth in legacy towns consistent with their historic internal needs and social and economic sustainability
2. Concentrate recreation and tourism investment along Highways 12 and 160, in legacy towns, and along North Delta waterways
3. Remaining Delta landscape dominated by agriculture and terrestrial habitat

Recreation and tourism

1. Enhance fishing, hunting, birdwatching, boating and other watersports through ecosystem management measures described above

Emergency management

1. Create a robust emergency management plan, including pre-positioning of materials for disaster response, identification of evacuation routes, and other necessities

Table 2.

Summary list of key differences between visions

** Asterisk indicates difference may be temporary; item must be evaluated by other group for possible inclusion*

Water supply and quality

Flexible Delta foresees:

No isolated conveyance facility

Linking Delta water exports to hydrologic and water quality conditions

Water storage islands as a key part of Delta water and ecosystem management*

A return aqueduct from the California Aqueduct to the San Joaquin River*

Resilient Adaptive Delta foresees:

Potential isolated conveyance facility in addition to Middle River conveyance, pending technical evaluation of both alternatives with action-oriented decision making.

Environment

Flexible Delta foresees:

Conversion of Bouldin Island and Webb Tract to terrestrial habitat*

Conversion of west end of Sherman Island to tidal marsh

Resilient Adaptive Delta foresees:

Exploration of tidal marsh potential on Fabian Tract and Netherlands Tract*

Land use

Flexible Delta foresees:

Transition of west Delta islands away from irrigated agriculture

Buffers to protect primary zone from secondary zone urbanization

Resilient Adaptive Delta foresees:

Reevaluation of primary and secondary zone designations*

Flood risk management

Flexible Delta foresees:

Securing west Delta islands with island levees or multiple-island ring levees

Resilient Adaptive Delta foresees:

Securing western Delta islands with a seismic risk reduction program that may include internal cross-levees, subsidence reversal, and levee strengthening*

Transportation, utilities and infrastructure

Flexible Delta foresees:

Strengthen levees on water conveyance channel, Stockton ship channel, and Highways 160 and 220*

6. SUMMARY OF RECOMMENDED NEAR-TERM ACTIONS

Given the high level of uncertainty, the Stakeholder Coordination Group (SCG) considered immediate near term, low regrets actions that could be taken prior to completing a Delta Vision Strategic Plan. A variety of measures were proposed and a survey was conducted to discern initial support and priorities for these measures. Of the thirty-six measures proposed, nineteen measures already appear in the two emerging visions being prepared by the group.

Methodology

SCG members were invited to participate in an online survey between July 27 and August 7, 2007. Respondents were asked to mark their level of support for the 36 proposed potential measures (see Appendix E for full text of proposals) as:

1. Support,
2. Potentially Support, or
3. Do Not Support.

Members were then asked to comment on their reasons of potential support or lack of support for each measure.

Outcomes

Twenty-nine (of 43) SCG members participated. Nine of the measures received overwhelming group support or potential support from the group. These nine were all part of the nineteen measures being incorporated in the emerging visions and included topics such as:

1. Preparing emergency plans for the Delta for life, property and infrastructure
2. Continuing to provide funding for levee maintenance and restoring tidal marsh in specific areas
3. Identifying lands needed for flood protection

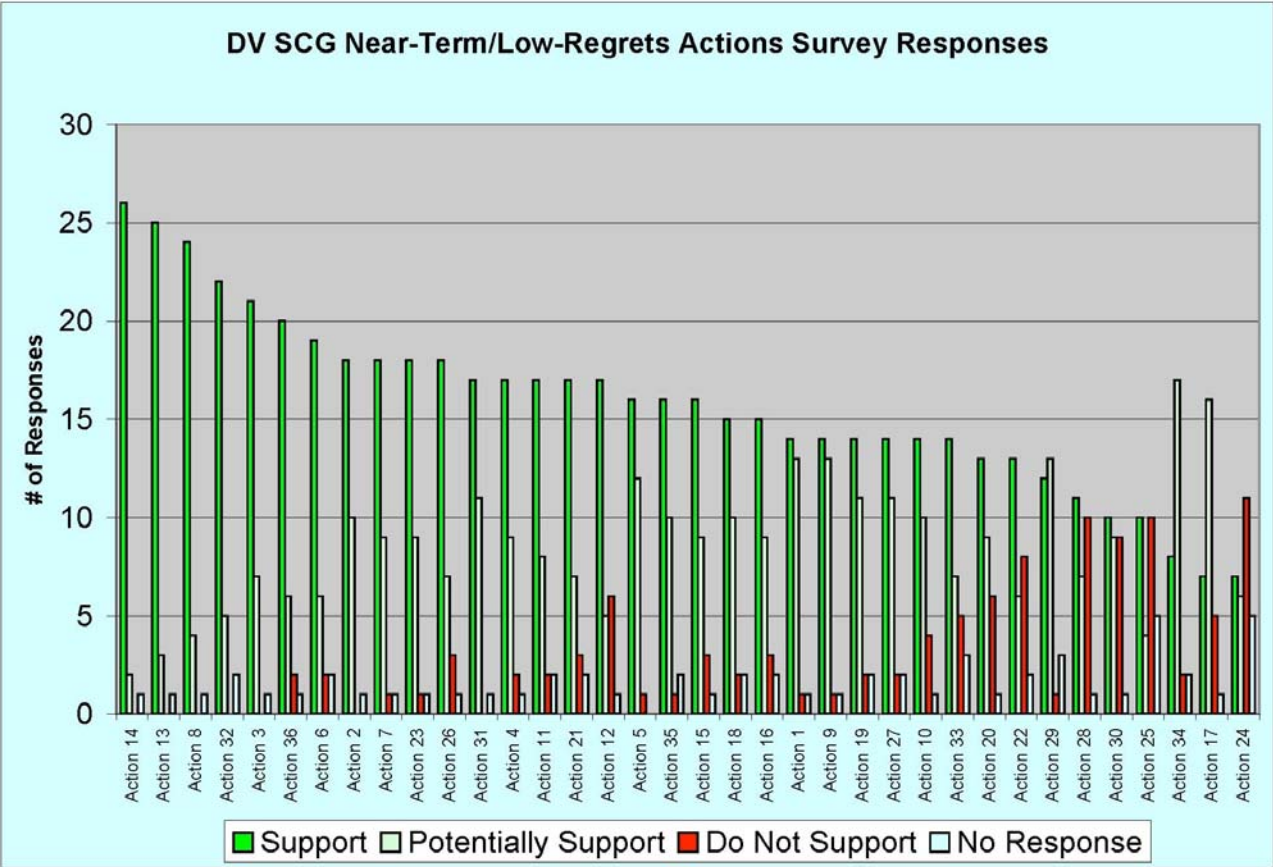
Regarding lands needed for flood protection, some respondents added a caveat that action should be restricted to “willing sellers” and priority should be given to public lands first.

In general, these highly supported actions are ones the group believes would need to be done regardless of the overall vision and they could proceed prior to a Strategic Plan being developed. Many SCG members also felt implementing some of the measures could generate additional information that would inform the Delta Vision Strategic Plan and visioning process.

Regarding the measures that received less support, in some cases a lack of data, information, or a clear plan to implement the measures were the most common reasons respondents cited. Many SCG members noted they would support some of the other actions if there was more specific knowledge about them such as what the impacts to agriculture might be, if the funding source was identified, and if cost-benefit analyses could be completed prior to implementation among others.

Since this survey was designed to gauge only the initial priority levels for some of these actions, the SCG will be working through the entire list in more detail at its September 2007 meeting. The group

will review each action and determine what might need to change to garner more support or whether there is not enough support for it to continue to be considered as a near-term/low-regrets action.



8/10/2007

Potential Interim Actions
Summary of Responses

| DV SCG Near-Term/Low-Regrets Actions Survey | | | | | |
|---|--|----------|---------------------|----------------|-------------|
| Action # | Description (shortened) | Response | | | No Response |
| | | Support | Potentially Support | Do Not Support | |
| Action 14 | Prepare emergency plans to deal with threats to lives and property in the Delta as well as critical local, regional and statewide infrastructure. | 26 | 2 | 0 | 1 |
| Action 13 | Implement a basic emergency response program in the Delta. | 25 | 3 | 0 | 1 |
| Action 8 | Increase Investment in Exotic Species Control (e.g. <i>egreta densa</i>). | 24 | 4 | 0 | 1 |
| Action 32 | Continue to provide regular levels of funding for Delta levee maintenance. | 22 | 5 | 0 | 2 |
| Action 3 | Expedite Implementation of the Dutch Slough Tidal Marsh Restoration Project. | 21 | 7 | 0 | 1 |
| Action 36 | Determine the water needs of the Delta, including what flow regime is needed under different conditions for a healthy Delta. | 20 | 6 | 2 | 1 |
| Action 6 | Acquire and Restore Decker Island. | 19 | 6 | 2 | 2 |
| Action 2 | Restore Tidal Marsh in Suisun Marsh. | 18 | 10 | 0 | 1 |
| Action 7 | Partition Sherman and Jersey Islands. | 18 | 9 | 1 | 1 |
| Action 23 | Run experiments on subsidence reversal, agricultural practices, habitat restoration, carbon sequestration. | 18 | 9 | 1 | 1 |
| Action 26 | Aggressively increase water conservation, water recycling and groundwater cleanup/groundwater desalination to increase water supply reliability. | 18 | 7 | 3 | 1 |
| Action 31 | Identify and purchase lands needed for flood protection, (e.g. flood corridors, room for levee setbacks, etc.) and environmental restoration (e.g. shallow water tidal habitat). | 17 | 11 | 0 | 1 |
| Action 4 | Restore and Enhance the Cache Slough Region. | 17 | 9 | 2 | 1 |
| Action 11 | Dredged Material Reuse | 17 | 8 | 2 | 2 |
| Action 21 | Implement demonstration projects at Franks Tract for salinity and fish protection and demonstration project screens at Clifton Court Forebay. | 17 | 7 | 3 | 2 |
| Action 12 | Cumulative Impact Analysis | 17 | 5 | 6 | 1 |
| Action 5 | Implement the McCormack Williamson Tract Flood Control and Ecosystem Restoration Project. | 16 | 12 | 1 | 0 |
| Action 35 | Provide increased protection for one or two infrastructure corridors (e.g. rail, road, aqueduct). | 16 | 10 | 1 | 2 |
| Action 15 | Fortify the levees in the Western Delta that we already know are the most vulnerable to the greatest risk - seismic failure. | 16 | 9 | 3 | 1 |
| Action 18 | Create additional bypass capacity in the North Delta and along the San Joaquin River. | 15 | 10 | 2 | 2 |
| Action 16 | Allow dredging to provide lower cost material for critical levee protection & Preserve navigation channels. | 15 | 9 | 3 | 2 |
| Action 1 | Restore Floodplain Habitat and Fish Migration Through the Yolo Bypass. | 14 | 13 | 1 | 1 |
| Action 9 | South Delta Floodway | 14 | 13 | 1 | 1 |
| Action 19 | Restore wetlands/riparian areas would lend added environmental stability to the Delta and the watershed and restore some measure of ecosystem health. | 14 | 11 | 2 | 2 |
| Action 27 | Implement the fish screen pilot project for the pumps in the South Delta. | 14 | 11 | 2 | 2 |
| Action 10 | Create a new Delta Conservancy | 14 | 10 | 4 | 1 |
| Action 33 | Develop a plan for the phased conversion of selected islands over time in response to sea level rise. | 14 | 7 | 5 | 3 |
| Action 20 | Cease agriculture practices that continue land subsidence, begin land use practices that would gradually increase island elevations. | 13 | 9 | 6 | 1 |
| Action 22 | Work towards (1) market based water distribution, (2) encouraging communities to make cost effective investments in groundwater storage, and (3) incorporating the flexible project operations. | 13 | 6 | 8 | 2 |
| Action 29 | Begin screening in-Delta diversions. | 12 | 13 | 1 | 3 |
| Action 28 | Reduce contamination entering the Delta by eliminating the agricultural waiver, eliminating drainage from drainage impaired lands in the San Joaquin Valley, and reducing runoff from urban areas. | 11 | 7 | 10 | 1 |
| Action 30 | Create a new Delta Conservancy to fund restoration and oversee land use in the Delta. | 10 | 9 | 9 | 1 |
| Action 25 | Retire (through purchase or otherwise) Westland Water District's water contract in order to leave more water in the Delta for ecosystem improvement. | 10 | 4 | 10 | 5 |
| Action 34 | Provide funding to bring flood management for already urbanized areas up to a 200 year standard. | 8 | 17 | 2 | 2 |
| Action 17 | Employ South Delta movable barriers. | 7 | 16 | 5 | 1 |
| Action 24 | Operate under the Mowle-Swanson recommendations. | 7 | 6 | 11 | 5 |

7. SUMMARY OF ASSURANCES, MITIGATION OR COMPENSATION ASSOCIATED WITH VISIONS

[TO BE INCLUDED AFTER THE SEPTEMBER SCG MEETING]

9. APPENDICES

APPENDIX A. “FLEXIBLE DELTA” VISION ELEMENTS

The “Flexible Delta” vision incorporates the following elements, categorized by the vision components listed in the Executive Order. For each component, the “Flexible Delta” team identified relevant guiding principles, vision characteristics, key issues and policy questions, and data and information needs.

A. Environment

i. Guiding principles

1. The Delta and Suisun are living systems that need to be maintained with the intent that productive landforms remain.
2. Maintain, restore, and build terrestrial and aquatic habitat necessary to support desired population levels of native and desirable non-native species, including migratory species.
3. Maintain management flexibility to respond to changing ecological conditions.
4. Incorporate adaptive management, including monitoring, evaluation, staged decision-making and course corrections, to respond to new scientific information and changed conditions.
5. Ensure that fish and wildlife used for food are safe to eat, including fish for food production.
6. Reduce upstream impacts on the Delta and downstream impacts on the Bay estuary.

ii. Vision characteristics

1. Restore floodplain along the main stem of the Sacramento River (upstream of the city of Sacramento) for the benefit of splittail and migrating salmonids, and to increase nutrient and organic carbon flows to Delta. Improve salmon spawning gravels in upstream reaches and tributaries of the rivers flowing into the Delta.
2. Enhance habitat along Old River and in west Delta with setback and vegetated levees.
3. Manage Yolo Bypass:
 - for the benefit of splittail and salmonids and other species,
 - to increase nutrient and organic carbon flows to Delta and
 - so flood conveyance capacity of the Yolo Bypass is maintained,
 - in a manner that does not negatively impact the water quality needs of the North Bay aqueduct.
4. Enhance channel configuration and hydraulics of Elk Slough, Sutter Slough, and Steamboat Slough to provide alternative route for migratory fish that avoids Georgiana Slough and the Delta cross-channel.

5. Improve hydraulic residence time and tidal exchange between Cache Slough and the Delta to contribute organic carbon, nutrients, phytoplankton and zooplankton to the Delta, for the benefit of Delta smelt among others. Create a hydrologic and terrestrial connection between Cache Slough and Suisun Marsh.

6. Restore Mokelumne and Cosumnes River corridors. Enter into formal flood flow agreements with private landowners in the Stone Lakes area and other potential flood bypass areas. Explore opportunities to increase flood flow areas.

7. Implement the Suisun Marsh PEIR/EIS, which will call for some conversion of managed wetlands into tidal wetlands as habitat restoration in Suisun Marsh (currently a brackish water habitat). Restore tidal action in a portion of each region of the Marsh as follows, based upon Preferred Alternative:

- 500 to 2,250 acres in Region 1
- 460 to 2,070 acres in Region 2
- 860 to 3,870 acres in Region 3
- 180 to 810 acres in Region 4

The plan will also call for managed wetland enhancement (46,000 acres to 39,000 acres) including the development of a funded exterior levee maintenance program.

8. Restore tidal marsh on Decker Island and Dutch Slough.

9. Maintain existing managed wetlands and create new tidal wetland habitats.

10. Restore various tidal wetlands ecological functions (to benefit clapper rails, delta smelt, and native plants, among others) in Suisun Marsh.

11. Manage Bouldin Island and Holland Tract for habitat.

12. Create setback levees at opportune sites in west Delta and the lower Sacramento River to allow tidal marsh restoration.

13. Convert the west end of Sherman Island to managed tidal marsh.

14. Based on results of pilot projects there may be salinity variation in the Southwest Delta.

15. Purchase terrestrial habitat and wetlands easements from willing landowners.

16. Assist in the achievement of habitat acquisition, creation, and enhancement goals of Central Valley Joint Venture for seasonal wetlands, semi-permanent wetlands, riparian forests, and waterfowl-friendly agriculture.

17. Assist in the acquisition of water needed for seasonal and semi-permanent wetland habitat acquisition, creation, and enhancement under the Central Valley Joint Venture plan.

18. Prevent, control and eradicate undesirable non-native species.

19. Establish and track performance standards for all ecosystem programs and investments.

Cross-listed from other sections

1. Restore seasonal floodplain on the lower San Joaquin River, including flood bypass on Paradise Cut.
2. Create new flood bypasses south of Vernalis for San Joaquin River and in Stone Lakes region. Study water system and ecosystem management implications.

iii. Key issues and policy questions

1. Determine how best to direct freshwater to and from southwest Delta.

iv. Data and information needs

1. What are the effects of gates on flow patterns, salinity, and water quality? Are the answers different east of Middle River and west of Old River? How do these answers change if in-Delta storage on Webb Tract and Bacon Island is implemented?
2. What are the salinity impacts of the proposed Delta salinity increases to Suisun Marsh management, infrastructure and habitat quality?
3. What are the ecological consequences of this vision?
4. There is a need for a transparent, easily accessible, ongoing resource information center for Delta to gather information so Delta stakeholders can access existing information and identify missing information/data.

B. Land Use

i. Guiding principles

1. The principal base land use in the Delta is agricultural with urban growth restricted to the secondary zones.
2. Encourage economically viable and environmentally friendly agriculture.
3. Maintain quality of life in the Delta.
4. Prevent urbanization of lands in deep flood plains, below future sea levels, or within important habitat areas.
5. Encourage land use and management practices that stabilize Delta land forms.

ii. Vision characteristics

1. Concentrate tourism and recreation investments along Highways 160 and 12, in north Delta waterways, and in legacy towns. Permit legacy towns to grow at historic growth rates driven by internal, locally-driven needs to expand local economies.

2. In the westernmost islands, an assisted transition may be needed from irrigated agriculture to recreation, wildlife habitat, unirrigated agriculture or other land uses if salinity fluctuation impacts irrigated agriculture.

3. Add buffers to protect activities in the primary zone wherever negative impacts are occurring.

Cross-listed from other sections

1. Water could be stored for release to the Middle River for in-Delta use and export, or to the Old River to augment flow and manage salinity and carbon levels.

2. Manage Bouldin Island and Holland Tract for habitat.

3. Purchase terrestrial habitat and wetlands easements from willing landowners.

iii. Key policy issues and questions

1. Land use conversion from private to public ownership must be preceded by proper legislation that protects existing tax base. Payment in lieu of taxes is not an acceptable method of protection.

iv. Data and information needs

1. Research into multiplier effects of local farming operations for local economies.

2. What are the potential impacts from Paterno decision on local land-use decision-making?

3. What urban growth patterns are anticipated in local government general plans?

4. What are implications of future flood mapping?

C. Transportation, Utilities, and Infrastructure

i. Guiding principles

1. Ensure security and reliability of all critical infrastructure, including water conveyance facilities, highways, railroads, ship channels, and electricity and natural gas networks.

ii. Vision characteristics

1. Rebuild Highways 12, 160 and 220 on top of seismically resistant, 100-year flood levees.

2. Protect critical infrastructure, including the water conveyance channel, and a South Delta infrastructure corridor (including Highway 4, the Mokelumne Aqueduct, and the BNSF Railroad) with seismically resistant levees.

3. Protect Stockton and Sacramento ship channels and water conveyance channel with seismically resistant levees. Promote the maximum use of beneficial dredge material.

4. Key electricity transmission lines and natural gas fields mostly protected on Sherman and Brannan-Island Islands; repair other reaches on an as-needed basis.

5. Improve and maintain Suisun levees to protect significant infrastructure such as natural gas production, Southern Pacific Railroad tracks, petroleum pipelines, built structures and wildlife habitat.

Cross-listed from other sections

1. Protect Ryer Island and Highway 84 Corridor with seismically resistant levees.

iii. Key issues and policy questions

1. What will be the impact of projected increases in activity associated with the Port of Oakland?

iv. Data and information needs

1. How will increased activity impact ship channel levees? What would be the impact of a ship channel levee failure when considering the elevation at the Port of Sacramento?

D. Water Supply and Quality

i. Guiding principles

1. Improve water quality in the south, central and north Delta.

2. Ensure that all who rely on Delta water have a secure, reliable, high-quality water supply.

3. Expand other water supplies in other regions of the state to reduce the demand from the Delta.

4. Ensure conveyance facilities and operations are compatible with ecosystem health and in-Delta water quality.

5. Minimize possibility of water supply interruption due to disaster.

6. Ensure that all water exported from the Delta is of sufficient quality to meet the needs of downstream domestic water treatment facilities.

7. Conduct water export operations from the Delta, which are consistent with protection of in-Delta agriculture and in-Delta water rights.

8. Reduce Delta water quality degradation from urban and agricultural discharges.

9. Delta water needs should be met first before water is exported to other regions of the state.

10. Ensure that fish and wildlife used for food are safe to eat, including fish for food production.

ii. Vision characteristics

1. Protect the existing island configuration but confine water conveyance to an armored channel along South Fork of Mokelumne and Middle River.
2. Partially segregate the water conveyance system and aquatic habitat with operable gates connecting Old and Middle Rivers, and siphon the Victoria Canal under Old River to deliver water to the Clifton Court Forebay.
3. Re-circulate some export water from California Aqueduct to San Joaquin River.
4. Link Delta export rates to hydrologic and water quality conditions.
5. Water could be stored for release to the Middle River for in-Delta use and export, or to the Old River to augment flow and manage salinity and carbon levels.
6. Ensure that water delivered through Middle River conveyance channel to the pumps is of higher quality than today.
7. Explore reduction of overall export quantities due to reduced conveyance capacity.
8. Extend Contra Costa intakes to Middle River to avoid Old River.

Cross-listed from other sections

1. Explore infiltration of floodwaters upstream to reduce Delta flood risk and replenish Central Valley groundwater aquifers.
2. Manage Yolo Bypass:
 - for the benefit of splittail and salmonids and other species,
 - to increase nutrient and organic carbon flows to Delta and
 - so flood conveyance capacity of the Yolo Bypass is maintained,
 - in a manner that does not negatively impact the water quality needs of the North Bay aqueduct.

iii. Key issues and policy questions

1. Identify potential for water savings through reasonable alterations of agricultural practices in the Central Valley and in the Delta.
2. Clarify how water savings can be applied to uses beneficial to the Delta given the current structure of water rights.

iv. Data and information needs

1. What are the options and impacts associated with various forms of storage within the Delta, whether for water supply or carbon production?

2. Review existing research on seepage associated with island flooding (either planned or unplanned) and use interceptor walls where most feasible. (Reference: Delta Wetlands Project, 2006 Update Report.)
3. Consider water quality impacts of closures of Delta Cross Channel and need for fish screens.
4. Water quality (and level) modeling is needed for central and south Delta and export pumps/facilities.
5. Consider placement of operable gates on Grantline Canal and upper Middle River for salinity control.
6. Check if vision would meet existing Water Board standards and consider what future updates may be needed.

E. Recreation, Tourism & Economic Dependence

i. Guiding principles

1. Maintain and enhance opportunities for all recreational activities occurring in the Delta.
2. Ensure that fishable, huntable and birdwatching species are maintained at healthy and harvestable population levels.
3. Enhance tourism potential of “legacy towns” along Sacramento River.

ii. Vision characteristics

1. Enhance fishing, hunting and birdwatching by ecosystem changes described above.
2. Enhance opportunities for boating and other water sports throughout the Delta and past operable gates.

Cross-listed from other sections

1. Concentrate tourism and recreation investments along Highways 160 and 12, in north Delta waterways, and in legacy towns. Permit legacy towns to grow at historic growth rates driven by internal, locally-driven needs to expand local economies.

iii. Key issues and policy questions

1. Boat locks at gated channels must be operated at all times to ensure boater access.

iv. Data and information needs

1. Recreational boating activity by channel.

F. Flood Risk Management

i. Guiding principles

1. Protect western islands from seismic failure.
2. Ensure continuous protection of Delta agriculture and Suisun Marsh levees to withstand drivers of change.
3. Minimize the possibility of a multiple-island failure.
4. Ensure that Delta communities and their vital resources are protected from floods (especially catastrophic floods) and earthquakes.
5. Prioritize levee improvement, repair and maintenance based on public safety and benefits.

ii. Vision characteristics

1. Protect Sherman, Twitchell, Brannan, Bradford, Webb, Jersey, and Bethel Islands with seismically resistant levees. Explore whether they are best protected by a continuous ring levee or individual levees by conducting cost analysis and reviewing other considerations, such as boat access.
2. Protect Sherman Island against levee failure to avoid destabilizing rest of Delta.
3. Protect legacy towns with seismically resistant, 100-year flood ring levees.
4. Provide seismically resistant flood protection for Sacramento and West Sacramento.
5. Provide seismically resistant flood protection for Stockton/Lathrop area.
6. Improve other levees to future 100-year flood protection as needs appear.
7. Protect Ryer Island and Highway 84 Corridor with seismically resistant levees.
8. Create seasonal floodplain on the lower San Joaquin River, including flood bypass on Paradise Cut.
9. Create new flood bypasses south of Vernalis for San Joaquin River and in Stone Lakes region. Study water system and ecosystem management implications.
10. Continually maintain and improve agricultural levees to meet the drivers of change other than seismic.
11. Develop and implement a levee maintenance program for Suisun Marsh to support water quality, existing wetland values and functions and ecosystem restoration activities.

12. Maintain Sacramento and Stockton ship channel levees to protect channel use.

13. Explore infiltration of floodwaters upstream to reduce Delta flood risk and replenish Central Valley groundwater aquifers.

Cross-listed from other sections

1. Rebuild Highways 12, 160 and 220 on top of seismically resistant, 100-year flood levees.

2. Protect critical infrastructure, including the water conveyance channel, and a South Delta infrastructure corridor (including Highway 4, the Mokelumne Aqueduct, and the BNSF Railroad) with seismically resistant levees.

3. Protect Stockton and Sacramento ship channels and water conveyance channel with seismically resistant levees.

4. Key electricity transmission lines and natural gas fields mostly protected on Sherman and Brannan-Island Islands; repair other reaches on an as-needed basis.

5. Improve and maintain Suisun levees to protect significant infrastructure such as natural gas production, Southern Pacific Railroad tracks, petroleum pipelines, built structures and wildlife habitat.

6. Enhance habitat along Old River and in west Delta with setback and vegetated levees.

7. Restore Mokelumne and Cosumnes River corridors. Enter into formal flood flow agreements with private landowners in the Stone Lakes area and other potential flood bypass areas. Explore opportunities to increase flood flow areas.

8. Create setback levees at opportune sites in west Delta and the lower Sacramento River to allow tidal marsh restoration.

iii. Key issues and policy questions

1. There must be standards for levee maintenance and upgrading, in addition to the traditional protection standard (e.g. 100-year flood protection levee).

2. A revised state Flood Control Plan – including a review of the operation of existing facilities – is necessary.

3. What are the potential impacts from Paterno decision on local land-use decision-making?

iv. Data and information needs

1. How can ring levees be employed for seismic protection of the western islands? What options are available? Polders? Levees? Other means? What alternatives are most economically viable? What are the implications for boat access?

2. What should be the requirements and standards for “seismically resistant” versus “flood protection” levees? A description of different levee standards associated with different land uses is required.

3. What is the potential for a San Joaquin flood bypass south of Vernalis, as opposed to one on Paradise Cut, which is prime farmland?

G. Emergency Management

i. Guiding principles

1. Ensure that Delta communities have evacuation routes, emergency response training teams, supplies, and other emergency response necessities.

2. Ensure regional coordination of state and local first responders / emergency responders.

ii. Vision characteristics

1. Identify areas to store materials for emergency response (including temporary channel barriers) as soon as possible.

Cross-listed from other sections

1. Protect critical infrastructure, including the water conveyance channel, and a South Delta infrastructure corridor (including Highway 4, the Mokelumne Aqueduct, and the BNSF Railroad) with seismically resistant levees.

iii. Key issues and policy questions

1. Need a comprehensive regional plan for emergency management that clarifies state and local rights and responsibilities in the event of a disaster.

iv. Data and information needs

1. Need specific information on security of evacuation routes (including water routes) in the event of disaster.

H. State and Local Economics

i. Guiding principles

1. Delta must maintain a viable local economy.

2. Ensure that local (including county) governments have sufficient revenue sources to provide services.

3. Protect the channels and levees that support shipping industries.

4. Ensure that Delta solutions contribute to sustainable statewide economic growth.

5. Ensure that fish and wildlife used for food are safe to eat, including fish for food production.

ii. Vision characteristics

Cross-listed from other sections

1. Concentrate tourism and recreation investments along Highways 160 and 12, in north Delta waterways, and in legacy towns. Permit legacy towns to grow at historic growth rates driven by internal, locally-driven needs to expand local economies.
2. In the westernmost islands, an assisted transition may be needed from irrigated agriculture to recreation, wildlife habitat, unirrigated agriculture or other land uses if salinity fluctuation impacts irrigated agriculture.
3. Maintain Sacramento and Stockton ship channel levees to protect channel use.

iii. Key issues and policy questions

1. How to ensure that local tax bases can survive if some land is taken out of private ownership and agriculture (e.g. turned into habitat or water storage).

iv. Data and information needs

1. More information is needed on the economics of existing and alternate services and land uses associated with the Delta, and the potential risks to them, including the importance of the Delta to the state economy.

APPENDIX B. “RESILIENT ADAPTIVE DELTA” VISION ELEMENTS

[FORTHCOMING AFTER SEPTEMBER MEETING]

APPENDIX C. DATA AND INFORMATION NEEDS

The following data and information needs have been identified in the process of developing long-term visions for the Delta, categorized by the vision components listed in the Executive Order.

The SCG has expressed a desire to have more information, modeling and/or research on:

A. Environment

1. The ecosystem characteristics (e.g. habitat types, ecological functions, etc) that constitute a “healthy” ecosystem
2. The feasibility of implementing, and effects on Delta ecosystems and existing water users of, alternative strategies to attain variable salinity in the west Delta
3. Other variable traits of a healthy ecosystem (water velocity, depth, temperature, residence times, turbidity, etc.) and the ways these traits might be recreated through both the timing and volume of freshwater flows and through non-flow measures (e.g. gates and barriers, variable channel bottoms, other structural restoration).
4. The effects of the sequencing of a given set of management actions, as well as more deliberate, technical consideration of the most logical sequence of staged conveyance options
5. The factors causing the pelagic organism decline
6. Monitoring of invasive species and better understanding of key environmental thresholds and engineered actions that might discourage or eliminate them (e.g. salinity thresholds, temperature thresholds, etc.)
7. How possible differing conveyance options affect decisions regarding proposed ecosystem restoration
8. Data collection on possible trade-offs between impacts of bioaccumulated mercury on human beings and wildlife, on one hand, and the need for restoration of a portion of the Delta’s historic floodplain and wetland habitat types, on the other.
9. The effects of gates on flow patterns, salinity, and water quality, whether the effects are different east of Middle River and west of Old River, how these effects might change if in-Delta storage is implemented?
10. The salinity impacts of the proposed Suisun Marsh management measures
11. The potential for a transparent, easily accessible, ongoing resource information center so Delta stakeholders can access existing information and identify missing information.

B. Land Use

1. Carbon sequestration and subsidence reversal potential of various crops, including tules and rice
2. Multiplier effects of local farming operations for local economies
3. The potential impacts from Paterno decision on local land-use decision-making
4. The urban growth patterns are anticipated in local government general plans
5. The implications of future flood mapping on land use decisions

C. Transportation, Utilities, and Infrastructure

1. Costs and benefits of moving critical infrastructure lines versus elevating or reinforcing them
2. How increased activity impact ship channel levees, and the impact of a ship channel levee failure when considering the elevation at the Port of Sacramento?

D. Water Supply and Quality

1. The potential effects of a peripheral conveyance on the water quality and ecosystem of the Delta, especially the north Delta
2. The potential effects of deliberate inundation of selected Delta islands, whether for water supply or carbon production.
3. The quality of water stored on such islands, its impact on overall export water quality, and its potential uses (ranging from irrigation to carbon production).
4. Seepage associated with island flooding (either planned or unplanned) and the use of interceptor walls to prevent this.
5. The effects of the sequencing of a given set of management actions, as well as more deliberate, technical consideration of the most logical sequencing of staged conveyance options.
6. The effects of regional climate change, especially snowpack reduction
7. Contingency planning for various climate change and snowpack reduction scenarios
8. Modeling, cost-benefit analysis, and planning for storage of flow peaks for use in dry season, including examination of both surface and groundwater storage options
9. The operational and cost implications of delivering peak flow water to selected storage locations.

10. How the development of new storage (surface and/or groundwater, upstream and/or south-of-Delta) would impact the costs and benefits of an isolated facility.
11. The water quality impacts of closures of Delta Cross Channel and need for fish screens.
12. The water quality (and level) needed for central and south Delta and export pumps/facilities.
13. Impact of operable gates on Grantline Canal and upper Middle River for salinity control.
14. Conformance with existing Water Board standards and consideration of what future updates may be needed.

E. Recreation and Tourism

1. Design and cost information on potential for including habitat and recreational elements into levee cross-sections
2. Recreational boating activity by channel.

F. Flood Risk Management

1. How upstream conditions, including precipitation patterns, snow pack conditions, reservoir operations and upstream urbanization, affect flood risks in the Delta and the Central Valley generally.
2. The impact of potential climate change scenarios on river hydrology and flood risks
3. Application of potential innovative subsidence reversal, subsidence reduction, carbon sequestration, and renewable fuels technologies
4. The conflicts and synergies between levee vegetation and structural levee integrity, reinforcement, and maintenance.
5. How ring levees, including Dutch-style “polders” can be employed for seismic protection of the western islands, their economic viability, and their implications for boat access
6. The requirements and standards for “seismically resistant” versus “flood protection” levees, and the levee standards associated with different land uses.
7. The potential for a San Joaquin flood bypass south of Vernalis, as opposed to one on Paradise Cut, which is prime farmland

G. Emergency Management

1. The security of evacuation routes in the event of disaster

H. State and Local Economics

1. The economics of existing and alternate services and land uses associated with the Delta, and the potential risks to them, including the importance of the Delta to the state economy.

APPENDIX D. COMMON ELEMENTS TO BE ADDED TO VISIONS

The following common elements language was crafted by the SCG in plenary session. Additional common visions elements may be developed at future meetings.

Suisun Marsh Plan

Integrate the outcomes of the Suisun Marsh PEIR/EIS Plan, which is currently under development. The Plan will call for numerous elements, including the conversion of some existing managed wetland to tidal wetland habitats and the enhancement of managed wetlands, as well as the development of a funded exterior levee maintenance program.

Based on the Preferred Alternative selected in the PEIR/EIS, the conversion of managed wetlands in each of the four identified regions in the Plan, will total between 3,000 to 10,000 acres. Actions completed under this Plan will benefit a variety of species, ecosystem functions, and water quality. Levee improvements will protect managed wetland habitat, Delta water quality, and significant infrastructure such as natural gas production, the Southern Pacific Railroad tracks, petroleum pipelines, and other built structures.

Fisheries and Wildlife Recovery and Restoration

To address the concerns about the long-term recovery and sustainability of aquatic, terrestrial and water fowl species, attention should be given to the following as starting points, building on the following guiding principle:

Maintain, restore, and build terrestrial and aquatic habitat necessary to support desired population levels of native and desirable non-native species, including migratory species.

- All levels of government, and their administering agencies, should ensure they perform their obligations to protect and manage fish and wildlife resources (in the context of other beneficial uses)
- Entrainment reduction strategies for aquatic species should be considered
- Commitments made and anticipated through programs such as the Joint Venture for terrestrial species and waterfowl should be reinforced.

Environmental Justice

Public outreach and participation involving Delta governance should include “capacity building opportunities” for impacted communities, especially low-income communities and communities of color. The ultimate decision-making on Delta issues should be transparent, and reflect balanced perspectives, including environmental justice.

APPENDIX E. NEAR-TERM ACTIONS SURVEY ITEMS

A list of potential near-term actions was posed to the Delta Vision Stakeholder Coordination Group and they were asked to answer whether they “Support”, “Potentially Support”, or “Do Not Support” by using the web-base SurveyMonkey.com software. This survey was taken by the group on-line between July 27 and August 7, 2007.

Below is a list of the items provided to respondents during the survey. The descriptions of the proposed actions differ greatly in detail because they come from different sources within the SCG.

1. **Restore Floodplain Habitat and Fish Migration through the Yolo Bypass.** Authorize construction of fish passage and flow control facilities at the Fremont Weir. Inundation of the Yolo Bypass provides excellent rearing habitat for juvenile salmon and splittail and critical spawning habitat for the splittail. Presently the bypass is only inundated once every three years on average and sometimes goes for four to five years without inundation. Increasing the frequency of inundation on even a small portion of the bypass could substantially improve conditions for splittail and salmon. Providing these flows would require notching or gating the Fremont Weir to allow a controlled inflow of water into the bypass in years when the stage of the Sacramento River is below the crest of the weir. The goal would be to create inundated floodplain habitat on a publicly owned portion of the bypass -- not privately owned land. Modification of the Fremont Weir could also allow improved fish migration through the bypass, permitting juvenile salmon to bypass the Delta cross channel and other hazards associated with migrating through the Delta. This project has been extensively studied by DWR and is called for by PPIC report (p. 79) and the CALFED Ecosystem Restoration Program Plan.
http://www.delta.dfg.ca.gov/erp/docs/reports_docs/Attachment_2.pdf
2. **Restore Tidal Marsh in Suisun Marsh.** Suisun Marsh has largely been managed as non-tidal seasonal wetlands for waterfowl and other birds. Levees and gates prevent tidal inundation of large areas of managed wetlands. Restoration of brackish tidal marsh would improve habitat for native fish in an area where they are less vulnerable to the Delta pumps. Brackish marsh restoration would reduce habitat for waterfowl, but these losses could be more than offset by creating and promoting managed freshwater marshes and wildlife friendly agriculture on central and western Delta Islands and in the Yolo Bypass. Unlike much of the Western Delta, elevations in Suisun Marsh allow immediate restoration of tidal marsh habitat. Restoration could start immediately at the Meins Landing site purchased by DWR for that purpose. Agencies should proceed with restoration planning for Van Sickle Island, as discussed in the PPIC report. (PPIC pg. 79, 182).
3. **Expedite Implementation of the Dutch Slough Tidal Marsh Restoration Project.** The 1,200 acre Dutch Slough site was acquired by DWR in 2003. DWR and its partners have completed a restoration plan that is especially designed both to restore habitat and generate information about how best to restore Delta habitat in the future. Information gained could be invaluable for long-term Delta management. The project is ready for implementation. DWR has completed a draft EIR and is expected to release it in the near future (PPIC, p. 82).
4. **Restore and Enhance the Cache Slough Region.** Cache Slough is an ecologically important but heretofore neglected portion of the Delta. The PPIC report recommends this region for restoration investment. (PPIC, p. 78, 182). Restoration of dendritic tidal marsh in the Calhoun Cut ecological

reserve owned by the Department of Fish and Game would significantly increase habitat for endangered fish in the Cache Slough Region. Similarly, restoration of regular seasonal flows and floodplain inundation will increase connectivity between Cache Slough and the upper Sacramento River.

5. Implement the McCormack Williamson Tract Flood Control and Ecosystem Restoration Project. The 1631 acre McCormack Williamson Tract was acquired in 1999 by The Nature Conservancy using Proposition 204 CALFED funds. The purpose of the Project is to implement flood control improvements on the Tract in a manner that benefits aquatic and terrestrial habitats and ecological processes. The Project presents unique opportunities for synergy in achieving flood control and ecosystem restoration goals in a high priority area prime for additional floodplain habitat (PPIC, p. 76, 80). DWR is currently completing a draft EIR for the larger North Delta Project of which the McCormack Williamson Tract improvements are listed as Group 1 actions. The EIR is expected to be complete by spring of 2007.
6. Acquire and Restore Decker Island. Decker Island, in the Western Delta, is composed of old dredged spoils and, unlike other Delta islands, is several feet above sea level. Material from Decker Island should be excavated and used to reinforce and partition nearby Delta islands such as Sherman and Jersey. Excavation of Decker Island could result in approximately 400 acres of restored tidal marsh along the main migration corridor for juvenile salmon and Sacramento splittail – two native species thought to benefit most from tidal marsh restoration. Thus, this project could contribute material to address Delta stability issues and create new habitat.
7. Partition Sherman and Jersey Islands. Partitioning these islands could create habitat, reverse subsidence, increase recreational opportunities, protect State Highway 160, and reduce the water quality consequences of levee failure (PPIC, p. 84). Sherman and Jersey Islands are strategically located in the western Delta where they are most vulnerable to seismic failure and most likely to entrain saltwater into the Delta in the aftermath of a levee failure. Sherman Island is owned by DWR. Jersey Island is owned by the Ironhouse Sanitary District, which is interested in partitioning the island and implementing a large-scale subsidence reversal project. Partitioning islands with cross levees reduces the area that would be flooded by any one levee breach -- reducing the amount of salt water entrained, enabling vehicle access after a breach, and reducing the cost of rehabilitation. The Natural Heritage Institute has developed a plan for partitioning and restoring Sherman Island. Save San Francisco Bay Association proposed partitioning Sherman Island in 1999.
8. Increase Investment in Exotic Species Control (e.g. *Egeria densa*): Exotic species are one of the primary drivers of change in the Delta and could constrain the success of future restoration and water supply investments. Significantly more funds should be allocated to university level research to evaluate potential control strategies and to Coast Guard and port authorities to assure that existing laws designed to prevent introductions are strictly enforced.
9. South Delta Floodway: Construct a South Delta Floodway to attenuate flood flows and redirect floodwaters away from the developed communities of Stockton and Lathrop. DWR should undertake modeling and initial design work evaluating a potential floodway, including, among other sites, Stewart Tract. DWR should also be authorized to purchase land. Variations of this project are included in most of the PPIC options (PPIC, p. 145-152). This project could provide multiple benefits, including flood management for Delta communities and for deeply subsided

Central Delta islands, improved water supply reliability, habitat restoration, and agricultural preservation.

10. Delta Conservancy and Agricultural Conservation Easements: Create a new Delta Conservancy, with the ability to respond rapidly to opportunities. There is an existing North Delta Conservancy, with limited jurisdiction and funding. Jurisdiction of a Delta Conservancy should include the entire legal Delta and lands adjacent thereto. The Conservancy should be authorized to purchase title and easements, and to undertake projects in areas including the environment, agricultural land preservation, historical preservation, tourism and recreation. In 2003, SB 86 (Machado), which would have created a Delta Conservancy, was passed by both houses, but was vetoed. Initial funding might be focused on agricultural conservation easements, with a primary focus on preventing urbanization in the secondary zone.
11. Dredged Material Reuse: Establish a DWR and local agency pilot project evaluating the potential for and the challenges facing large scale reuse in the Delta of clean material dredged from San Francisco Bay. One of the challenges managers face in the Delta is a shortage of affordable material suitable for levee maintenance. Every year, millions of cubic yards of sediment are dredged from the Bay. Much of the material dredged from the Bay is clean and structurally suitable for use in levee maintenance. Indeed, dredged material is commonly used for levee construction and maintenance, both in the Bay and Delta. In addition, Delta reuse of Bay dredged material could assist in raising bottom elevations on subsided Delta islands. Impermeable Bay mud could be used to cap, prior to restoration, Delta islands which may contain sediment contaminated with Mercury. Thus, Bay material could provide levee stability, habitat and water quality benefits. The CV RWQCB has raised concerns regarding the potential for salty Bay dredged material to result in salinity impacts in the Delta. In 1999, Save San Francisco Bay Association prepared a scoping-level analysis of Delta reuse of Bay dredged material that identified several potential strategies to reduce salinity impacts. Given these strategies, as well as the need for material to assist in habitat restoration and the prevention of large-scale failures in the Delta (followed by large scale salt intrusion), a pilot project could produce valuable information. Sherman or Jersey Islands could be appropriate sites for such a pilot project. (See related recommendation above.)
12. Cumulative Impact Analysis: Provide funding to the Delta Protection Commission and DWR's Division of Flood Management to analyze potential cumulative impacts, over the next 50 years, of urbanization in the primary and secondary zones of the Delta and on adjacent lands. Potential impacts analyzed should include, but not be limited to, flood risks to existing and potential future Delta residents, risks to water supplies and infrastructure, habitat loss, endangered species impacts, fisheries impacts, lost opportunity for habitat restoration, impacts to agriculture, and risks associated with climate change (e.g. sea level rise, increasing percentage of precipitation falling as rain and increased intensity of storms.) The PPIC report identified urbanization as an important, but overlooked, driver of change within the Delta (PPIC, p. 55).
13. Emergency Response: Implement a basic emergency response program in the Delta (e.g. pre-positioning material and equipment). Strategically stockpile borrow material, sand bags, and other materials in various locations around the Delta. Assure that there is adequate barge and trained personnel capacity to respond to unexpected events such as seismic levee failure. A large-scale public works program to substantially rebuild western Delta islands could significantly increase emergency preparedness by assuring a trained, well equipped, and pre-contracted levee repair capacity. [Additional information was presented related to human safety and related aspects of

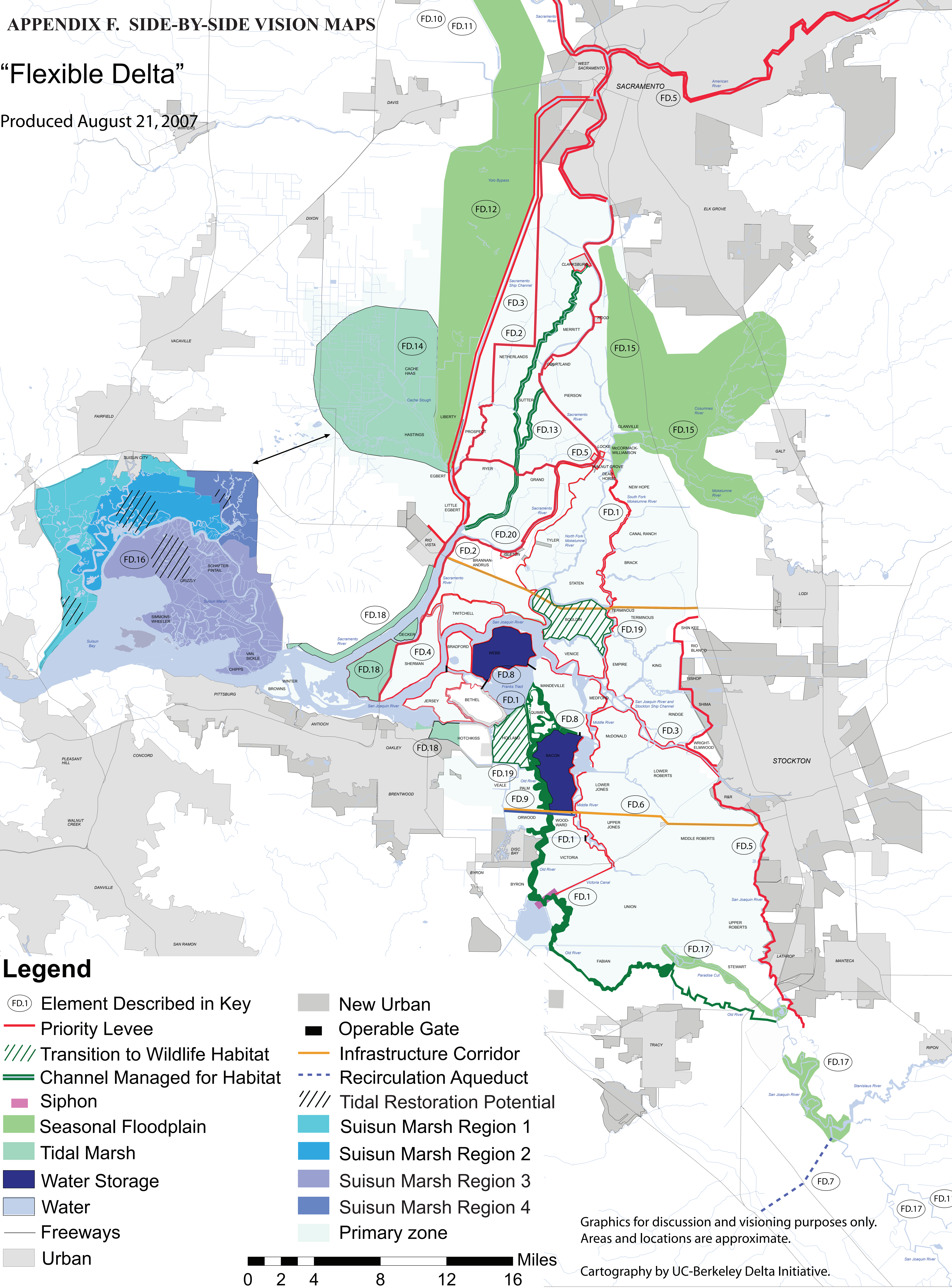
emergency planning and preparedness, but this was not included in either of the initial lists being merged. How would you like to handle this?]

14. Prepare emergency plans to deal with threats to lives and property in the Delta as well as critical local, regional and statewide infrastructure.
15. Fortify the levees in the Western Delta that we already know are the most vulnerable to the greatest risk - seismic failure.
16. Allow dredging to provide lower cost material for critical levee protection. Preserve navigation channels to allow for more environmentally friendly goods movement to central valleys.
17. Employ South Delta movable barriers.
18. Create additional bypass capacity in the North Delta and along the San Joaquin River.
19. Considering 95% of the Central Valley's wetlands have been destroyed, restore wetlands/riparian areas would lend added environmental stability to the Delta and the watershed and restore some measure of ecosystem health. There would be immediate fish and wildlife, plus recreational, benefits with no regrets.
20. Cease agricultural practices that continue land subsidence, begin land use practices that would gradually increase island elevations.
21. Implement demonstration projects at Franks Tract for salinity and fish protection and demonstration project screens at Clifton Court forebay.
22. Work towards (1) market based water distribution (after health and safety needs are met for all communities), (2) encouraging communities (using carrots and/or sticks) to make cost effective investments in groundwater storage, and (3) incorporating the flexible project operations available through the EWA and B2 supplies in operating rules.
23. Use the land that is already owned by federal and state agencies and by nonprofits to run experiments on subsidence reversal, agricultural practices, habitat restoration, carbon sequestration.
24. Operate under the Moyle-Swanson recommendations. Ensure actions necessary for anadromous fish health are also implemented.
25. Retire (through purchase or otherwise) Westland Water District's water contract in order to leave more water in the Delta for ecosystem improvement and to reduce impacts on other exporters.
26. Aggressively increase water conservation, water recycling and groundwater cleanup/groundwater desalination to increase water supply reliability.
27. Implement the fish screen pilot project for the pumps in the South Delta.

28. Reduce contamination entering the Delta by eliminating the agricultural waiver, eliminating drainage from drainage impaired lands in the San Joaquin Valley, and reducing runoff from urban areas (through stormwater capture and other methods).
29. Begin screening in-Delta diversions.
30. Create a new Delta Conservancy to fund restoration and oversee land use in the Delta.
31. Identify and purchase lands needed for flood protection, (e.g. flood corridors, room for levee setbacks, etc.) and environmental restoration (e.g. shallow water tidal habitat).
32. Continue to provide regular levels of funding for Delta levee maintenance.
33. Develop a plan for the phased conversion of selected islands over time in response to sea level rise.
34. Provide funding to bring flood management for already urbanized areas up to a 200 year standard.
35. Provide increased protection for one or two infrastructure corridors (e.g. rail, road, aqueduct).
36. Determine the water needs of the Delta, including what flow regime is needed under different conditions for a healthy Delta.

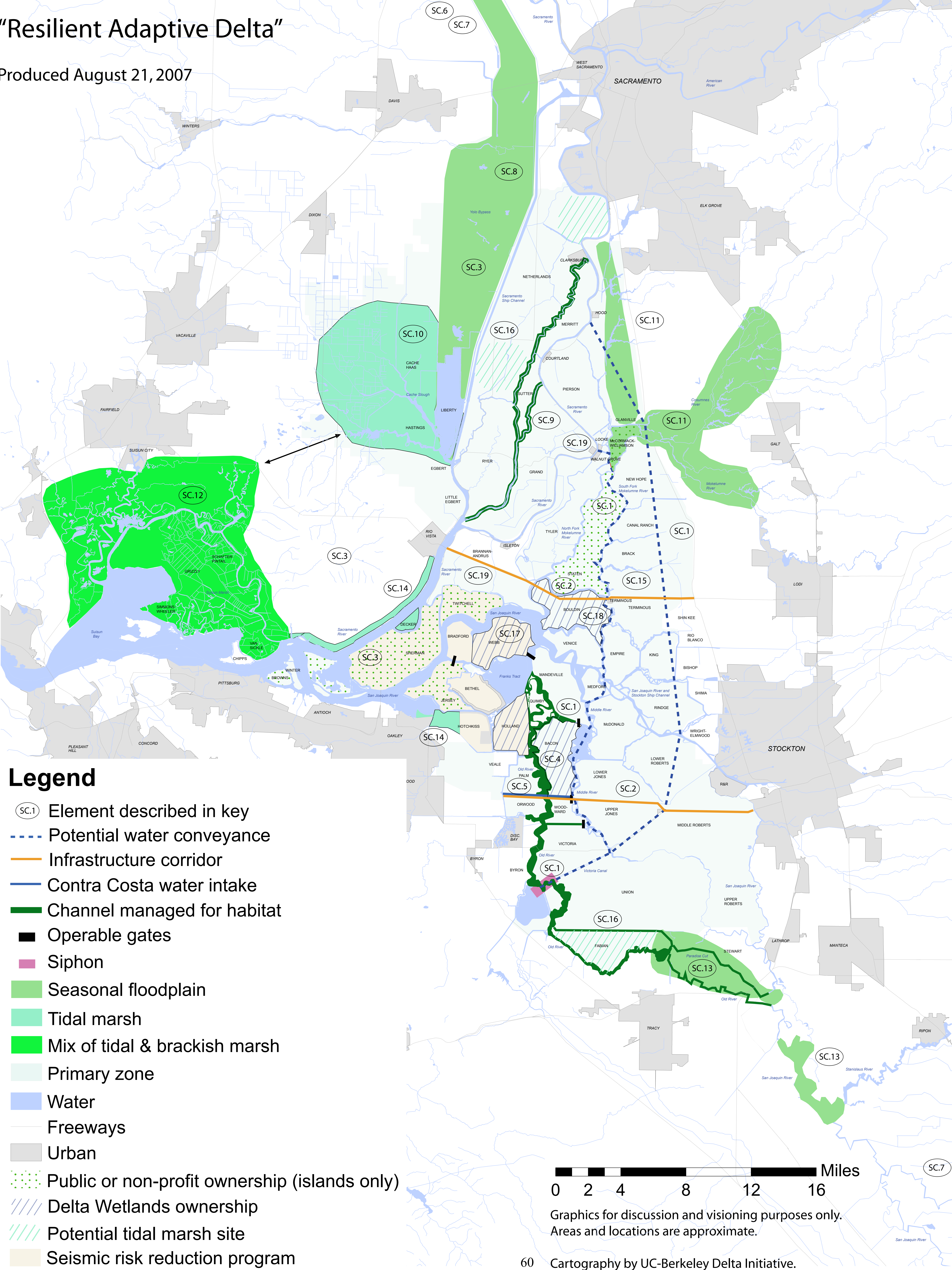
“Flexible Delta”

Produced August 21, 2007



"Resilient Adaptive Delta"

Produced August 21, 2007



8. IDENTIFICATION OF KEY STRATEGIC PLANNING ISSUES

[TO BE INCLUDED AFTER THE SEPTEMBER SCG MEETING]