Draft: Findings from Context Memos

The following key points, or "findings," are those listed or inferred from the context memos.

Agriculture

1. Depending on disposition of leased publicly-owned lands and future water quality, agricultural production is likely to remain at or above 2007 levels for the foreseeable future, although crop patterns will shift to address changing market and environmental factors. *(summary, pg. 9, line 40 to page 10, line 15)*

2. Agricultural land ownership is likely to continue the trend of increasing concentration and vertical integration. There seems to be a trend away from fee title public acquisitions of Delta lands towards the use of conservation easements. *(summary, pg. 10, line 28 to pg. 11, line 7)*

3. Pressures to build houses will continue to complicate agricultural land uses in both the Primary and Secondary Zones of the Delta. Ranchette development is more problematic for agriculture in the Primary Zone; urban development is undermining the buffer function of the Secondary Zone. *(summary, pg. 12, line 19 and pg. 13, lines 3-13)*

4. The State does not have an overarching plan or strategy for the conservation of its agricultural resources. *(pg. 15, line 5)*

5. There is no integrated comprehensive strategy for agricultural land use in the Delta. The Delta's land use is governed by the Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta as required in the Delta Protection Act in the general plans of each of the five Delta counties. *(summary, pg. 15, line 35 to pg. 16, line 2)*

6. The survival of agriculture in the Delta depends on a commitment to improving and maintaining Delta levees. *(pg. 19, lines 39-41)*

7. Land subsidence from all causes (erosion, compaction, oxidation) is a continued threat to Delta agriculture. *(pg. 20, lines 1-4)*

8. Salinity in irrigation water from any source (levee failure, sea level rise, increased water exports, etc.) will result in shifts to lower value crops and perhaps the cessation of agriculture. *(summary, pg.20,lines 5-14)*

9. Agricultural landowners in the Delta see ecosystem restoration efforts and increase recreation use in the Delta as both a threat and an opportunity. *(pg. 20, lines 15-16)*

10. One conceptual model for the future of Delta agriculture is of a mosaic of environmental services integrated with, and provided on a base of, agricultural land uses, where growers receive income from providing not only food, but wildlife habitat, occasional flood water retention, levee maintenance, recreation and carbon sequestration. *(summary, pg. 21, line 41 to pg. 22, line 6)*

11. In-Delta water users, including agriculture, [...] fear a diminished water conveyance role for the Delta will lead to diminishing public investment in levees, and the eventual loss of these Delta uses. *(pg. 21, lines 19-22)*

Analog Ecosystems

1. There is no substitute for the independent authority to act.

2. The more independent the players, the more fragmentation and less accountability.

3. The agency that raises the revenue should spend the money.

4. Without a vision you do not know where you are going. *(pg. 3, lines 3-27)*

Delta Governance

1. The historic trajectory of the Delta, in both its institutions and its policies, shows a trend towards more comprehensive representation of interests, areas, and issues. *(pg. 20, lines 29-31)*

2. There is a need for better ecological stewardship of this region. *(pg. 20, lines 36-37)*

Demand Management (Water Use Efficiency)

1. Water use efficiency is an option that is available to regional and local agencies in their management of water supplies and demands; significant potential for water use efficiency exists outside the Delta. *(pg. 2, lines 21-22; 26-29)*

2. Reducing the demand on Delta inflows and exports or the demand for additional supply facilities that would affect the Delta can be achieved either by reducing their marginal value to the region or by increasing the costs of their use (or development) relative to regional water efficiency measures. *(pg. 4, lines 15-18)*

3. Since the characteristics and the objectives differ between urban and agricultural water suppliers, it is reasonable to expect that implementation of water use efficiency differs. *(pg. 6, lines 31-33)*

4. Aggressive investment in water use efficiency actions can result in significant reductions in applied water use over the next 25 years. *(pg. 9, lines 37-39)*

5. There is solid demand at the local level for state and federal water use efficiency grants. *(pg. 10, lines 4-5)*

6. Sufficient project-level baseline data or observed project cost and performance data have not been collected. The lack of project- program-level data severely limits the use of adaptive management for water use efficiency program improvement. *(pg. 11, lines 9-13)*

Ecosystem

1. The Delta of today is very different ecologically from the Delta of 200 years ago; shifting boundaries between land and water became more fixed because of levee building and human occupation. *(summary, pg. 8, lines 6-16)*

2. The physical environment (hydrology, climate, chemistry, landforms) of the Delta and associated lands establishes the template within which the ecosystem mosaic of the Delta is formed. Changes in climate and weather will have dramatic effects on the physical template of the Delta/estuary. *(pg. 2, lines 28-30; pg. 3, lines 1-6; summary, pg.12, line 8 to pg. 25, line 35)*

3. The natural environment of delta/estuaries is dynamic and variable and the organisms that live there are adapted to that variability. *(pg. 2, lines 35-36; summary, pg. 10, line 1 to pg. 12, line 7)*

4. Climate and weather are primary drivers of the physical environment of the Delta/estuary. *(pg. 3, lines1-6; summary, pg. 17, line 1 to pg. 20, line 12 and pg. 59. line 3 to pg. 60, line 2)*

5. Individual species have particular tolerances for habitat variables, which have changed in the past and which will continue to change. The future Delta/estuary

environment may exceed the tolerance limits of some species or uncouple signals to important processes. *(summary, pg. 3, lines 13-23 and pg. 44, line 2 to pg. 50, line 11)*

6. Humans and human-created landscape units are integral to the ecosystem mosaic of the Delta and have profound influence on the overall ecosystem dynamics. *(pg. 3, lines 30-32; summary, pg. 36, lines 1-19; and pg. 54, line 4 to pg. 59, line 29)*

7. Primary production is the foundation of ecological production and food webs supporting fish and birds in the Delta. *(summary, pg. 3, lines 37-42 and pg. 33, line 22 to pg. 39, line 16)*

8. The potential energy established by primary production can follow a number of pathways in the ecosystem: it can be exported, buried, or consumed. A high proportion of energy in Delta aquatic species is cycled thorugh the less efficient microbial pathway rather than phytoplankton production. *(summary, pg. 4, lines 4-12 and pg. 39, line 18 to pg. 42, line 34)*

9. Competition and predation are fundamental processes structuring the biological community. *(summary, pg. 4, lines 17-24 and pg. 38, line 2 to pg. 39, line 16)*

10. Species dynamics is determined by the balance between births and deaths within a population. *(summary, pg. 4, lines 32-42, and pg. 44, line 28 to pg. 50, line 16)*

11. The Delta/estuary is a mosaic of terrestrial and aquatic ecosystems that interact in important ways (i.e., ecosystem patches). This concept of ecosystems as a mosaic of patches nested within larger patches has important implications for the way humans manage and interact with the landscape. *(summary, pg. 5, lines 11-24 and pg. 25, line 37 to pg. 32, line 40)*

12. Invasive species are capable of disrupting ecosystem processes and can have serious negative effects on native species. *(summary, pg. 5, lines 34-42 and pg. 51, line 14 to pg. 53, line 14)*

13. Ecosystems are complex, dynamic and self-organizing. The Bay-Delta ecosystem is human dominated and any sustainable vision for the Bay-Delta needs to incorporate both the human and the non-human dimensions of the ecosystem. *(summary, pg. 6, lines 12-26 and pg. 54, line 4 to pg. 64, line 29)*

Emergency Response

To be developed

Flooding and Levees

1. Flooding is the most common and damaging natural disaster in California and has caused more economic damage to the state than all other natural disasters combined. *(pg. 2, lines 3-4)*

2. The floodwaters in the State are mostly managed through artificial systems. […] the Delta is shaped by levees that provide constant protection from flooding because most lands in the area have subsided and the ground is below mean sea level; therefore, Delta levees commonly work "full time" retaining water at all time, compared to levees that provide protection only during high flows. *(pg. 2, lines 8-14)*

3. More than 90 percent of the land in the Delta is included in FEMA's flood zones. Virtually all existing services in the Delta are dependent on Delta levees. *(pg. 2, lines 21-22)*

4. The current system for construction, maintenance and repairs of levees is highly fragmented among state, federal and local authorities and results in significant separation of decisions from responsibility of payment and of liabilities. *(pg. 3, lines 25-27)*

5. The Delta is subject to flooding from high water events (e.g., extreme storms) or from tidal influences combined with weather events; this makes the Delta particularly vulnerable to sea level rise. *(pg. 5, lines 24-38)*

6. Global climate change will increase the stresses on Delta levees. *(pg. 8, lines 2-3)*

7. There is a disparity of opinions about the effectiveness of maintaining levees and their future stability. There is also debate about the probability of a seismic event that would be strong enough to cause major damages in the Delta. *(pg. 9, line 6-10)*

8. The potential impacts on people and communities of a single failure or multiple failures are catastrophic. These risks tend to be disproportionately higher in rural and economically disadvantaged communities that are often unable to invest in flood control improvements. *(pg. 11, line 40 to page 12, line 2)*

Land Use

1. Urbanization is manageable through governmental policies that are needed to shape a durable plan for a sustainable Delta. *(pg. 2, lines 4-5)*

2. A shift in land use from agriculture or ecosystem conservation to urban development is irreversible. *(pg. 2, lines 6-7)*

3. Solutions for water quality, flood management, public safety risk reduction, habitat restoration and rising sea level are foreclosed if land use is urbanized both within the Delta-Suisun region and, in some places, on the surrounding lands. *(pg. 2, lines 8-11)*

4. Public safety is inherently compromised and state and local governments' legal and political liabilities multiplied and amplified with increased urbanization of lands below sea level and on river floodplains. *(pg. 2, lines 12-14)*

5. Private and public financing for needed urban development is disproportionately spent on the high risk regions of the Delta and Suisun areas rather than on less risky urban centers. *(pg. 2, lines 15-17)*

6. California population growth and urban development increases the pressure on Delta agricultural and open space lands by breaking the land up into small parcels and fragmenting them, or by urbanizing the land. *(pg. 4, lines 5-7)*

7. The dominant constraint for both urban and agriculture land use, as well as for transportation, utility corridors and recreation, are the levees. *(pg. 9, lines 3-4)*

8. California's development patterns are shaped by local governments' need for revenue. *(pg. 11, lines 12-28)*

9. There is no cabinet-level administrative department in California dealing with land use planning or community affairs for the state, or specifically for the Delta. *(pg. 13, lines 12-13)*

10. Current trends in land use will change the Delta region and limit the choices for future comprehensive strategies for water conveyance, utilities, agriculture, transportation and ecosystem restoration. *(pg. 29, lines 3-5)*

11. Levee reconstruction could contribute to urbanization because the added value of urban development meets cost benefit analysis for federal and state cost sharing. *(pg. 29, lines 10-12)*

12. Fiscal policies from all levels of government compete and collide with other policies, such as housing needs or jobs, across city and county boundaries in the Delta. *(pg. 29, lines 13-19)*

13. The current array of Delta local land use decision making is fragmented and may compound Delta management. The San Francisco Bay Conservation and Development Commission is more successful in protecting regional resources than the Delta Protection Commission because it has permitting authority. *(pg. 29, lines 20-24)*

14. The state has limited land use authority, yet can influence land use decisions through infrastructure funding for flood management, transportation and housing. Current state policy can motivate collaborative planning at a regional level. *(pg. 29, lines 31-33)*

Local and State Economies

1. The Delta economy includes a variety of persons who have different economic relationships with the Delta. Some people or businesses work or do business in the Delta but reside elsewhere, while others reside in the Delta but work elsewhere. All of these people and businesses are part of the "Delta economy," but they are affected by policy actions in the Delta in profoundly different ways. *(pg. 2. lines 8-14)*

2. The wider state economy is influenced by a number of services provided by the Delta. *(pg. 2, line 16)*

3. The Delta is important as a place of business and residence. *(pg. 3, lines 11-16)*

4. The Delta region is important to the State because it includes vital transportation and conveyance facilities. *(pg. 5, lines 1-5)*

5. The Delta is a key conduit of the state's water supplies for both urban and agricultural uses. *(pg. 5, lines 7-8)*

6. The Delta is economically important for a variety of natural and mineral resources (such as agriculture, recreation, natural gas production and wastewater treatment.) *(pg. 5, lines 17-27)*

7. Population in the Delta will increase, but not likely in the Primary Zone. *(pg. 5, lines 37-39)*

8. Increasing international trade is an important trend affecting the region, affecting exports and goods movement as well as adjustments as production relocates to other nations. *(pg. 6, lines 13-21)*

9. The value of recreation in the Delta will depend on changing tastes and technology, and likely will remain focused on quality fishing and boating. *(pg. 6, lines 23-27)*

10. The designation of flood-prone areas can change and such changes can result in large public and private costs. *(pg. 20, lines 34-35)*

11. [There is an] apparent disconnect between State liability and local land use planning that results in "inconsistent responsibilities" for liability and permitting responsibility. *(pg. 21, lines 18-33)*

12. The economic analysis suggests that water supply costs of some events are closely related to their duration, and those calculations could influence future decisions regarding an isolated facility or storage options. *(pg. 21, lines 35-39 to pg. 22, lines 1-2)*

13. There is need for benefit-cost analysis from the State and national perspectives. Delta policies that may include a significant federal cost share, cost and benefits analyses from the State and federal perspective are advisable. *(pg. 23, lines 3-9)*

Recreation

1. The Delta provides a wide range of recreational opportunities, including fishing, hunting, boating, camping, picnicking, and nature viewing. *(pg. 2, lines 3-5)*

2. The Delta's proximity to the Bay Area and Sacramento region and its diversity of recreation settings and experiences makes it a popular recreation destination. Use of Delta recreation facilities mainly comes from people living within 40-60 miles of the Delta; growth in surrounding communities outside the Delta will have a significant impact on Delta recreation. *(pg. 2, lines 19-21; pg. 15, lines 30-38)*

3. Most in-Delta recreation facilities are provided by private marinas, two-thirds of which are more than 40 years old. *(pg. 3, lines 26-27; pg. 16 lines 19-20)*

4. There are 22 publicly owned recreation areas in the Legal Delta (Primary and Secondary Zones). These include federal, State, county, city, land trust, and port-run facilities. Additional public lands are also reserved for wildlife protection and preservation. *(pg. 3, lines 32-35)*

5. Overall recreation levels in the Delta are forecasted to increase over the next 10 to 20 years, but at a slower rate than regional or state population growth; hunting and fishing will likely decrease *(pg. 15, lines 22-28)*

6. Illegal dumping and abandoned vessels throughout the Delta contribute to Delta water quality degradation (pg. 16, lines)

7. There is potential to develop recreational opportunities in the Delta (e.g., legacy towns as cultural and historic interpretive destinations; biking; bird watching, etc.), but sites to develop are limited because of the lack of available land with good road and water access. *(pg. 16, lines 38-40; pg. 17, lines 14-41 to pg. 18, lines 1-31)*

Suisun Marsh

1. Suisun Marsh is the largest contiguous brackish water wetland remaining on the west coast of North America and is more than 10 percent of California's remaining natural wetlands. *(pg. 4, lines 23-24; pg. 6, lines 32-35)*

2. Suisun Marsh supports the State's commercial and recreational salmon fishery by providing important tidal rearing areas for juvenile fish. *(pg. 8, lines 21-22)*

3. The existing levee system is critical to maintain salinity conditions under existing operations and conserve water supply resources; more than 200 of the 250 miles of Suisun Marsh exterior levees do not have any public financial assistance for levee maintenance and repair. *(pg. 8, lines 33-34; pg. 17, lines 15-16)*

4. Tule elk have benefited from past intensive management programs and are now thriving under current Marsh management strategies. *(pg. 10, lines 4-5)*

5. There are seven conceptual models that capture for the Suisun Marsh the state of knowledge regarding key relationships, drivers, and uncertainties. *(summary of pg. 10, lines 20-41)*

6. The wetland areas of Suisun Marsh are a mosaic of private and public ownerships, with the private landowners controlling more than 60 percent. *(pg. 17, lines 6-7)*

7. A draft Programmatic Environmental Impact Statement/Environmental Impact Report about the Suisun Marsh is scheduled to be released in spring 2008. *(pg. 19, lines 1-5)*

Sustainability

1. Sustainable management requires that specific actions be implemented in relationship to an identified resource.

2. Sustaining a resource is a process, requiring actions to be taken over time that result in a sustainable resource.

3. Sustainable is not a legally defined term that mandates certain actions in the context of an identified resource. Existing law can force actions that demand implementation of sustainable management practices.

4. Sustainable management has no universally accepted meaning in politics or academia. The varied definitions can be synthesized to encompass the three Es – environment, economics, and equity. *(pg. 10, lines 29-38)*

Transportation

1. The major transportation infrastructure continues to be the interstate highways and state highways through the Delta. Three key issues introduce difficulties to planning for the transportation system: divided responsibilities, unclear responsibility for flood damages, financing difficulties. *(pg. 3, lines 21-23, 25, 34; pg. 4, line 1)*

2. The Delta transportation web provides the main link between the Bay Area and the Central Valley. *(pg. 4, lines 36-37)*

3. The Delta transportation system is critical to emergency response and reconstruction following a levee breach. *(pg. 5, lines 20-21)*

4. Use of area highways is expected to continue expanding with population. In the longer future, higher fuel costs and better transportation alternatives could reduce highway traffic. *(pg. 13, lines 11-13)*

5. Increasing freight traffic for rail and ports is expected, primarily related to international trade. International trade volumes are continuing to increase as production and trade adjust to international trade agreements and comparative advantage. *(pg. 13, lines 40-41)*

6. The passenger train routes are continuing to grow as population growth moves out of the Bay Area into surrounding counties. These services are expected to continue to grow, but continued public funding will be required. *(pg. 14, lines 7-9)*

7. The existing transportation infrastructure in the Delta is prone to flooding as a result of levee failure, and local flooding can close roads during severe storms. *(pg. 15, lines 30-32)*

Utilities

1. The Delta is the location for a diverse collection of infrastructure and utilities; there is not and never has been a grand plan for utilities in the Delta. *(pg. 2, lines 6-13)*

2. The Delta region is a focal point for an inordinate amount of utilities assets that have diverse and increasing importance, including importance to the state as a whole. It is important to distinguish between utilities that serve local areas of the Delta and other utilities that have regional or statewide importance or impacts. *(pg. 2, lines 30-32; pg. 14, lines 35-36)*

3. The Delta Protection Commission (DPC) developed a long-term resource management plan for the Delta Primary Zone that prevents urban development and extensions of urban utilities in the Primary Zone unless they are already present or were permitted by zoning in 1992. *(pg. 3, lines 28-33)*

4. The development of utilities within the Secondary Zone is the responsibility of local planning agencies (county and city), and involves land owners, developers, utility agencies, and service providers. *(pg. 3, lines 35-37)*

5. For utilities serving local areas, the main issues are the extent and duration of local flooding and the cost of repairs for resumption of services. *(pg. 14, lines 37-38)*

6. Many regional/statewide utilities could be repaired expeditiously if they were impacted by flooding due to levee breaches. In considering the overall significance of these regional utilities disruptions, there is a need to compare with other infrastructure, particularly the state and federal water projects, the Delta levee flood control system, and the state highways crossing the Delta. *(pg. 15, lines 1-2, 17-20)*

7. Public policy pertaining to the Delta is complex and difficult to describe simply; each pertinent level of government either articulates policy or, though inaction, creates a de facto policy. *(pg. 16, lines 24-28; pg. 16, lines 4-5)*

8. There is no special state or regional policy pertaining to existing or proposed local utilities in the Delta's Secondary Zone. *(pg. 19, lines 37-38)*

9. There is no unified policy addressing the management of existing or installation of new utilities that have regional or statewide significance and that are located in the Delta. *(pg. 21, lines 6-8)*

10. The one over-arching policy area that is relevant to all discussion of Delta infrastructure/utilities policy within the Primary and Secondary Zone is the present state/federal policy on flood management and associated emergency response. There are two distinct and contrasting policies in place for the Primary Zone and the Secondary Zone. *(pg. 22, lines 6-10)*

11. The State's existing exposure and tolerance of risks to local, regional, and state utilities within the Delta must be individually considered; the state must decide whether it is willing to allow the ever-increasing risk exposure represented by new and upgraded utilities investments in the Delta. *(pg. 24, lines 16-17, 25-26)*

Water Governance

1. The Delta water management governance structure is a complex network of interacting laws and agencies each with overlapping goals and mandates. *(pg. 2, lines 7-8)*

2. Delta water governance may need to be re-assessed to meet the public objective of sustainable management of the Delta. *(pg. 2, lines 36-37)*

3. The Public Trust Doctrine obligates the state to protect public trust resources. The Public Trust Doctrine requires the state to take the public trust into account in the planning and allocation of water resources and to protect public trust uses where feasible and consistent with the public interest. *(pg. 5, lines 31-34)*

4. In California, groundwater that is not flowing in a known and definite channel is not regulated under a statewide permit system. *(pg. 6, lines 5-6)*

5. There is incongruity in implementing law and regulations. Government laws and regulations affecting management of water supplies which are executed and enforced by governmental agencies sometimes regulate other agencies. Agencies regulating the same subject matter need to coordinate better to ensure that their methods do not conflict. *(pg. 23, lines 11-15)*

Water Supply and Water Quality

1. California's water system is designed and managed to meet a number of demands in regions throughout the State; the Delta, which plays a critical water supply and conveyance role in the State, faces an array of water supply and water quality challenges to meet these statewide objectives. *(pg. 2, lines 10-11, 17-19)*

2. Delta water quality is driven by a complicated array of hydrodynamics. Coupled with actions and exports, management for species and habitats, and meeting the needs of in-Delta users, the water quality parameters in the Delta are in a constant state of flux. *(pg. 15, lines 1-14)*

3. Annually diverting nearly 8 million acre-feet of water from the Delta requires a lot of management and operational decisions made by many individuals as well as federal and State institutions. These decisions are made within a tangled, often controversial setting of laws, regulations, and agreements. *(pg. 17, lines 31-35)*

4. Hydrologic variability – resulting in high-water events or water supply shortages – add to the complexity of managing water supplies in the Delta. Predictions of future climate change may only increase this variability. *(pg. 20, lines 30-32)*

5. Electrical generation is produced as a direct result of releases of water through power facilities at CVP and SWP storage reservoirs. The ability to generate power however is complicated by demands placed on these same reservoirs to release cold water under certain conditions to facilitate fishery survival, as well as the need to meet downstream flow requirements and flood control releases that may not be optimally timed with power production. Hydropower production is complicated further by the potential for more varied storage conditions under projected climatic changes. *(pg. 23, lines 10-18)*