SUISUN MARSH RESOURCE MANAGEMENT
GOALS, ISSUES & SOLUTIONS

Introduction

The goals and issues contained in this document, unless otherwise noted, come unaltered from material prepared to assist with the public scoping process for the Suisun Marsh Draft PEIS/R. Additionally, this document contains draft "solutions" to these goals and issues that were prepared by the Planning Committee for the Making Science Work for Suisun Marsh Workshop. These solutions are intended solely as a starting point to facilitate discussion at the workshop and do not represent either the views or intended actions of the Suisun Marsh Charter Group and its member organizations.

Additional comments, received during or shortly after the Making Science Work for Suisun Marsh Workshop, are highlighted in red and underlined.

Goals, Issues and Draft Solutions

Goal 1: Ecological Processes – Rehabilitate natural processes where feasible in the Suisun Marsh to more fully support, with minimal human intervention, natural aquatic and associated terrestrial biotic communities and habitats, in ways that favor native species of those communities, with a particular interest in waterfowl and sensitive species.

a) Restoration activities in the Suisun Marsh may affect the numbers and frequency of occurrence of birds, mammals, plants and aquatic species in the Marsh.

Solution 1) Develop baseline biological resource inventory prior to conducting restoration projects to ensure effects on existing species communities are minimized.

Solution 2) Collect baseline biological resource data prior to conducting restoration projects and assess how the numbers and composition of the flora and fauna compare following restoration.

Solution 3) Conduct managed wetland enhancement projects concurrently with tidal restoration projects with an emphasis on regional scale ecosystem processes.

b) Most Suisun Marsh land surfaces within leveed areas have subsided below mean sea levels, thus complicating seasonal wetland management and tidal marsh restoration options.

Solution 1) Develop alternative seasonal wetland management strategies that sustain wintering waterfowl foraging needs and that, in order of preference, reverse, avoid, or minimize soil subsidence.

Solution 2) To the extent possible, concentrate tidal restoration in areas with the least subsidence and with adjoining higher ground.

Solution 3) Field test suite of options for subsidence reversal in tidal marsh restoration, including siting projects near larger sediment sources, maximizing sedimentation processes through geomorphic configurations and pre-breach emergent vegetation, and selective fill placement.

Solution 4) Evaluate feasibility of constructing muted microtidal marshes in which the marsh plain elevation can be controlled through installation and operation of water control structures. Microtidal marshes are effectively a management "intermediate" between managed wetlands and tidal marsh.

Solution 5) Evaluate potential benefits to target resources and potential adverse impacts to fisheries of restoring more deeply subsided sites as open-water areas to provide resting habitat for water birds, foraging habitat for diving ducks and other water birds that feed in deep water, or as shallow-water habitat. Such open water restorations in the Delta often support non-native predatory fish populations to the detriment of target native fisheries.

Solution 6) Dredge silted in sloughs and use the spoil to improve levees and perhaps counteract subsidence.

c) Existing managed wetland infrastructure in Suisun Marsh is subject to degradation that may impair habitat quality and management efficiency and requires routine maintenance.

Solution 1) Develop cost effective corrosive resistant infrastructure for marsh management

Solution 2) **S**treamline routine maintenance permitting

Solution 3) Identify cost sharing opportunities to facilitate infrastructure replacement and maintenance

d) Isolation of bay waters from seasonally managed wetlands in Suisun Marsh has created detrimental ecological conditions for some aquatic and tidally dependent species.

Solution 1) Restore tidal wetland functions to areas currently isolated by levees. Tidal restoration projects will require extensive planning, engineering, hydrodynamic modeling, and biological

monitoring and evaluations. Address subsidence concerns as described in Goal 1(b).

Solution 2) Examine feasibility of constructing muted microtidal wetlands on lands currently isolated by levees. Microtidal wetlands will require the same planning, design, and monitoring as tidal marsh restoration.

Solution 3) Examine feasibility of constructing habitat levees within tidal marsh and microtidal wetlands restoration projects. Habitat levees have gentle gradients to support a broad band of transitional habitats and can be designed to overtop on higher tides. Habitat levees will require the same planning, design, and monitoring as tidal marsh and microtidal marsh restoration.

e) Existing levees isolate the Suisun Marsh plain from tidal influence, altering salinity regimes, sediment transport, and hydrodynamic patterns to the detriment of natural ecological processes.

Solution 1) See Goal 1(d)

Solution 2) Implement an expanded aquatic food-web research program to better understand the linkage of adjacent and transitional wetland habitats and the aquatic food-web.

f) Tidal prisms - Lack of a tidal prism isolates dead end channels and the alteration of an existing tidal prism may affect the physical and ecological recovery in Suisun.

Solution 1) Develop tools for simulating scenarios of Marsh restoration and Bay effects by hind casting past changes to the Marsh and Bay.

Goal 2: Habitats – Protect, restore, and enhance habitat types where feasible in the Suisun Marsh for ecological and public values such as supporting species and biotic communities, ecological processes, recreation, scientific research, and aesthetics.

a) Historical diking, water diversions, and land management practices have reduced the presence and availability of habitat for tidal marsh dependent species.

Solution 1) See Goal 1(d)

Solution 2) Track the distribution of rare plants, listed species and species diversity in different tidal and managed environments to improve our understanding of conservation approaches and ecological processes that support these species, their habitats and, for plants, the habitats they provide.

b) Limited size, connectivity, and range of habitat types have reduced the presence and population viability of tidal marsh dependent species.

Solution 1) See Goal 1(d)

Solution 2) Implement a landscape scale examination to understand the ecological processes that best support tidal marsh dependent species. Examine target species presence and utilization of different habitat types, the spatial distribution of these habitats throughout Suisun, the spatial distribution of levee conditions as a function of maintenance needs, hydrodynamic modeling results identifying regional salinity effects of tidal marsh restoration, spatial and temporal variation in sediment supply, protective levee requirements, and so forth. Where ecological information on target species is limited, carry out necessary studies to fill those data gaps.

c) Habitat requirements for many species differ and thus create conflicts regarding management of the marsh resources.

Solution 1) See Goals 1(a) and 2(b)

d) Unscreened water diversions entrain fish species of concern.

Solution 1) Continue screening unscreened, high priority diversions in the Suisun Marsh whose screening would provide a significant fisheries benefit.

Solution 2) Develop seasonal wetland management strategies that are compatible with fisheries needs and managed wetlands habitat goals.

e) See issue and solution Goal 1(f)

Goal 3: Levee System Integrity – Provide long-term protection for multiple Suisun Marsh resources by maintaining and improving the integrity of the Suisun Marsh levee system.

a) Exterior levee maintenance is difficult due to limitations on the use and expense of available materials, high costs of levee work, and physical and regulatory constraints.

Solution 1) Develop a Suisun Marsh levee program, with funding and permit authorization for dredging in adjacent tidal sloughs for levee maintenance.

Solution 2) Classify levees according to maintenance requirements. For those lands protected by the highest maintenance levees, consider their suitability for restoration to tidal marsh or muted microtidal marsh with habitat levees.

b) The lack of a coordinated emergency response plan poses a threat to critical Marsh resources in the event of an emergency created by a levee failure and property inundation.

Solution 1) See Goal 3(a)

Solution 2) Develop a Suisun Emergency Flood Response Plan and carry out periodic training exercises amongst response organizations, land owners, and residents in the marsh.

Goal 4: Non-Native Invasive Species – Prevent the establishment of additional non-native species and reduce the negative ecological and economic impact of established non-native species in the Suisun Marsh.

Comment 1: Preventing additional invasions is a laudable goal, however, a more realistic one is to limit additional invasions.

Comment 2: The workshop presented much information on the substantial and permanent influence and effects of introduced species. While no one will disagree with Goal 4, it is prudent to reconsider this goal given the fact that many of the introduced species in Suisun Marsh will continue to have a substantial impact on the ecosystem, and that it is very difficult and expensive to prevent the introduction of new species that become established in other parts of the estuary.

a) Many non-native invasive species are present in the Marsh and often prove detrimental to native species of both managed and tidal wetlands through indirect or direct competition, and/or by predation.

Solution 1) Develop a coordinated non-native invasive plant management program for Suisun Marsh managed and tidal wetlands. This program should include research into understanding conditions that support such plant species colonization, establishment, persistence, and dispersal in existing wetlands and in future marsh restoration efforts.

Solution 2) Monitor populations of non-native invasive aquatic invertebrates that affect food web processes in order to understand their effects on ecological support functions of Suisun especially but not limited to fisheries resources.

Solution 3) Evaluate the effects of all management actions on invasive species. This relates to the issue of scaling: actions will be undertaken on the landscape level but the effects of those actions need to be examined at the species level. Perhaps we can develop monitoring protocols for species of interest and insert these templates into large (and small) scale action plans.

Goal 5: Water and Sediment Quality – Improve and/or maintain water and sediment quality conditions to provide good quality water for all beneficial uses and fully support healthy and diverse aquatic ecosystems in the Suisun Marsh; and to eliminate, to the extent possible, toxic impacts to aquatic organisms, wildlife, and people.

a) Current wetland management and future marsh restoration activities may increase methyl mercury loading in the water column and benthic sediments of the marsh.

Solution 1) Promote inclusion of Suisun field study sites in existing and upcoming methylmercury research efforts. Ensure that study sites include natural tidal marshes, restored tidal marshes, and managed wetlands in order to evaluate comparative differences.

Solution 2) Improve effectiveness of warnings about health effects of consuming mercury-contaminated fish from Suisun Marsh and bay, especially warnings for non-English speakers.

b) Planned levee breaches and unplanned levee failure may affect Suisun Marsh and Delta salinity levels.

Solution 1) Continue regional hydrodynamic modeling of existing conditions and suite of future scenarios including an overlay of relative levee maintenance needs to identify levees of greater and lesser susceptibility to failure. Modeling should identify areas where levee breaches would have greater and lesser effects on salinity within Suisun and the Delta.

c) Some fish species may be affected by low dissolved oxygen levels that may occur in sloughs of the marsh at certain times of the year.

Solution 1) Monitor sloughs that may be subject to low dissolved oxygen levels to determine extent of problem and potential impacts on fish.

Solution 2) Improve flows in sloughs affected by low dissolved oxygen levels. Redirect wetland discharges away from small sloughs with limited flows and into larger sloughs subject to higher flows or greater tidal exchange.

Solution 3) Examine feasibility of using temporary, mobile aerators or oxygenators where low dissolved oxygen discharge water cannot be rerouted or its discharge timing changed to protect fisheries resources.

d) Planned levee breaches may cause localized higher salinity levels and decrease tide stage such that adjacent land and water management is impaired.

Solution 1) See Goals 1(d) and 5(b)

e) See issue and solution Goal 1(f)

Goal 6: Public Use and Waterfowl Hunting: Maintain the heritage of waterfowl hunting and increase the surrounding communities' awareness of the ecological values of the Suisun Marsh.

a) The general public and some agencies lack awareness about Suisun Marsh and its resources.

Solution 1) Develop fact sheets highlighting Suisun Marsh and its resources and distribute to target audiences via mail and the internet.

Solution 2) Develop education and outreach programs that build knowledge of Suisun Marsh resources and hunting . Examples include events that draw visitors to the marsh to see and learn about wildlife and fish, signage and displays along Suisun City waterfront, public roads leading into marsh, and at Grizzly Island SWA, Solano Land Trust's Rush Ranch docent program, youth hunting and fishing events, and K-12 marsh education curricula and field trips.

Solution 3) Hold annual Suisun Marsh tours for local elected and administrative officials, including planning and public works departments, to discuss marsh resources and needs and actions that may affect the marsh.

b) Tidal marsh restoration in Suisun Marsh will reduce managed wetland acreage and may alter existing wildlife populations and waterfowl hunting heritage and hunting success.

Solution 1) See Goals 1(a) and 1(d)

Solution 2) Assess alternative strategies to sustaining waterfowl hunting in areas restored to tidal action.

c) Changing management strategies in the Suisun Marsh will depend on the willingness and cooperation of public and private landowners.

Solution 1) Collaborate with SRCD, other marsh leadership, resource managers, and scientists to exchange up to date management strategy information and its scientific basis.

Solution 2) Use SRCD board and committees as advisors to SMCG agencies during plans development and implementation.

Solution 3) Provide information to marsh landowners about marsh ecology and management through the SRCD newsletter and special meetings.

Solution 4) Manage parts of Grizzly Island WSA and selected other sites as demonstration areas that showcase and evaluate new marsh management strategies, with field days to help private marsh managers learn from these sites' experiences.

d) The loss or failure of waterfowl hunting clubs in Suisun Marsh may have secondary economic impacts on the local economy.

Solution 1) See Goal 6(b).

Solution 2) Document economic impact of hunting and club management in the surrounding communities.

Solution 3) Explore opportunities to develop supplemental income for hunting clubs through off-season rentals, bed-and-breakfast, or other non-traditional sources.

Solution 4) Document the economic impact of converting duck clubs to unmanaged habitats that may provide passive wildlife and other recreational opportunities.

e) Potential adjacent urbanization may affect the unique ecological and cultural characteristics of Suisun Marsh.

Solution 1) Collaborate with local land use agencies to ensure they have and utilize the most recent scientific information in their land use decisions in order to avoid conflicts with sustaining Suisun Marsh's unique characteristics.

Solution 2) Develop a cooperative program to protect or acquire buffer areas adjacent to Suisun Marsh and where appropriate to restore or enhance these buffers.

Solution 3) To mitigate effects of boat traffic from expanded use of Suisun marinas and boats ramps, develop a cooperative program with local agencies to establish and enforce zones prohibiting boat wakes that may affect California black rail nesting areas and

prohibit motorized boats in some Suisun Marsh dead-end channels from March to June to protect clapper rail nests..

Solution 4) Develop storm-water runoff management program with Suisun city and Fairfield to assure run-off from new development does not degrade marsh water quality or important habitats on creeks tributary to marsh.

Solution 5) Create "early warning system" to identity and address potential developments that might adversely affect adjacent marsh areas.

General comments on this document

1. Reconsider solutions. Several of the solutions listed under various goals focus more on the collection of additional information and don't really describe how that information will be used to achieve the stated goal. Each solution statement should explicitly state how its implementation will help to achieve the stated goal.
2. Consider temporal and spatial scales in restoration planning and goals. The recent workshop provided lots of good information on the importance of considering the appropriate spatial and temporal scales in developing a restoration plan for Suisun Marsh. For example, defining a planning boundary that excludes the local watersheds has substantial implications on how the planning document treats ecological connections between Suisun Marsh and its watershed. We also learned how dynamic Suisun marsh salinity and hydraulic processes are, varying over the tidal cycle, seasonal cycle, and longer-term climatic cycles. Finally, both temporal and spatial scales must be considered when we determine managed wetland success based on water fowl that migrate thousands of miles and complete critical portions of their life cycle in other countries.