DELTA STEWARDSHIP COUNCIL
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December 23, 2010

Ms. Debbie Hultman
California Department of Fish and Game
Bay Delta Region
P.O. Box 47
Yountville, CA 94599.

Dear Ms. Hultman:

Please find comment by the Delta Stewardship Council on the Suisun Marsh Habitat Management, Preservation, and Restoration Plan Draft EIR/EIS (SMP).

DSC staff finds that the draft SMP is a comprehensive attempt to reconcile 1) restoration and enhancement goals under the CALFED ROD, 2) water management actions under the Suisun Marsh Preservation Agreement (SMPA), and 3) Biological Opinion conflicts over a Regional General Permit application by the Suisun Resources Conservation District (SRCD) and the Department of Fish and Game (DFG). The Draft makes good progress toward these goals. The DSC comments herein focus on four shortcomings of the SMP compared to goals of the Sacramento-San Joaquin Delta Reform Act of 2009 (Div. 35 of the Water Code). This Act updates State policy for the Delta and Suisun Marsh.

1. Managed wetland land management practices cause ongoing land subsidence. Provisions of the SMP offer enhancements to managed wetland operations that do little to solve the root cause of the problems that create the need for enhancement. In addition, the subsidence related greenhouse gas inducing effects of the Plan are not identified.
2. The approach to tidal restoration lacks scientific foundation. There is little evidence of the Plan's claim to be a "science-based management plan." An adaptive management plan is not included.
3. The tidal marsh restoration plan calls for what appears to be an arbitrary allocation of restoration land in four geographic regions of Suisun Marsh with little justification.
4. Modeling analysis conducted for the Plan is inaccurately referenced for key conclusions of the Plan.

If you have questions or comments, please contact Lauren Hastings (lauren.hastings@deltacouncil.ca.gov) or Chris Enright (cenright@deltacouncil.ca.gov).

Sincerely,

for P. Joseph Grindstaff
Executive Officer

Attachment

Delta Stewardship Council (DSC) Staff review of the Suisun Marsh Habitat Management, Preservation, and Restoration Plan Draft EIS/EIR

Role of the Delta Stewardship Council with respect to Suisun Marsh and the Suisun Marsh Plan

The Delta Stewardship Council staff has reviewed the Suisun Marsh Habitat Management, Preservation, and Restoration Plan Draft EIR/EIS (SMP). Our review focused on assessing the consistency of the SMP with provisions of the Delta Reform Act. In general, the Act calls for a legally enforceable comprehensive management plan for the Delta and Suisun Marsh that balances coequal goals for a more reliable water supply for California and Delta ecosystem restoration (achieved in a manner that protects and enhances the unique values of the Delta as an evolving place). Referred to as the Delta Plan, its ecosystem goals will promote characteristics of a healthy Delta ecosystem including:

- Viable populations of native resident and migratory species.
- Functional corridors for migratory species.
- Diverse and biologically appropriate habitats and ecosystem processes.
- Reduced threats and stresses on the Delta ecosystem.
- Restore large areas of interconnected habitats within the Delta and its watershed by 2100.
- Achieve a more natural salinity regime in parts of the Delta.
- Manage the Delta's water and environmental resources and the water resources of the state over the long term.
- Provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem.
- Use the best available science.

"Restoration" is defined in the Act as: "...the application of ecological principles to restore a degraded or fragmented ecosystem and return it to a condition in which its biological and structural components achieve a close approximation of its natural potential, taking into consideration the physical changes that have occurred in the past and the future impact of climate change and sea level rise."

The Delta Plan may incorporate other completed plans related to the Delta and Suisun Marsh, such as the SMP, but only to the extent that these other plans promote the coequal goals in a manner consistent with the Delta Reform Act.

The Act also assigns ongoing CALFED Bay-Delta Program responsibilities to the DSC. The DSC is therefore a "Principal Agency" under the SMP with responsibility for providing guidance on restoration science through the Science Program (pg. ES-3 of the SMP).

Summary comments

DSC staff finds that the draft SMP is a comprehensive attempt to reconcile 1) restoration and enhancement goals under the CALFED ROD, 2) water management actions under the Suisun Marsh Preservation Agreement (SMPA), and 3) Biological Opinion conflicts over a Regional General Permit application by the Suisun Resources Conservation District (SRCD) and the Department of Fish and Game (DFG). The Draft makes good progress toward these goals. The DSC comments herein focus on four shortcomings of the SMP compared to goals of the Delta Reform Act.

1. Managed wetland land management practices cause ongoing land subsidence. Provisions of the SMP offer enhancements to managed wetland operations that do little to solve the root cause of the problems that create the need for enhancement. In addition, the subsidence related greenhouse gas inducing effects of the Plan are not identified.
2. The approach to tidal restoration lacks scientific foundation. There is little evidence of the Plan's claim to be a "science-based management plan." An adaptive management plan is not included.
3. The tidal marsh restoration plan calls for what appears to be an arbitrary allocation of restoration land in four geographic regions of Suisun Marsh with little justification.
4. Modeling analysis conducted for the Plan is inaccurately referenced for key conclusions of the Plan.

Specific comments

1. Land subsidence

Staff is concerned that no consideration appears to have been given to subsidence control and reversal, the very problem that drives the need for many of the managed wetland enhancement actions. This is a key impact of the wetland enhancement actions that is not identified by the plan. Land subsidence is the direct result of diked wetland management practices. It is caused primarily by aerobic microbial oxidation of soil organic carbon, which also produces CO_2 greenhouse gas emissions. Subsidence also can occur through anaerobic decomposition, dried soil compaction, wind erosion, and wetting/drying cycles (e.g., Deverel and Rojstaczer 1996). Each of these processes is promoted by common management practices that require dry soil between late spring and early fall. While dry, common maintenance practices include discing and burning undesirable vegetation. These permitted activities (USCOE 404 RGP) are powerful drivers of land subsidence.

Levee system integrity is a primary focus of the managed wetland enhancement portion of the Plan. The Plan would permit phased dredging of 5.9 million cubic yards of tidal slough material for levee maintenance over the 30-year life of the Plan (approximately 100,000 cy per year). The stated needs for levee enhancements are that 1) landowners are otherwise forced to use diked wetland soils as source material for levee maintenance which exacerbates land subsidence and 2) tidal restorations will require upgrades to boundary levees to exclude tidal water from adjacent land. Each of these needs is driven by 2-8 feet of land subsidence across the managed lands of Suisun Marsh. Other portions of the plan point out the lack of public funding for managed wetland levee maintenance and the likelihood that levee failures could result in salinity intrusion and affects on drinking water quality. Again, land subsidence is the root cause.

Finally, the nature of microbial decomposition of organic soil means that land subsidence contributes to CO_2 emissions. The Plan gives good coverage to the carbon sequestration benefits of tidal marsh restoration (Chap. 5.9-12), but does not describe the opposite, and possibly larger, effect of land subsidence. These impacts should be estimated in the alternatives as well as the "no action alternative."

Recommendation: Provisions of the SMP provide enhancements to managed wetland operations that do little to solve the root cause of the same problems that require enhancement. To be consistent with Delta Reform Act goals for ecosystem restoration, stressor reduction, and sustainable resource management, the Plan should describe the direct and indirect impacts of wetland enhancements including land subsidence and contributions to greenhouse gas emissions.

2. Science foundation

The plan clearly states that the SMP will be based on "sound science... and science-based adaptive management" (pg. 1-19). The plan describes a "Science Integration Strategy" that employs a Science Advisor and, notably, a suite of conceptual models covering managed wetland and tidal habitat functions developed specifically to inform plan actions. The plan also asserts that it is guided by Delta Regional Ecosystem Restoration Implementation Plan (DRERIP) conceptual models (pg. 1-20). Despite these claims, review of the key chapter called "Habitat Management, Preservation, and Restoration Plan" (Chapter 2), reveals a no reference to any conceptual models or peer reviewed literature. The unpublished U.S. Fish and Wildlife Service (USFWS) *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (TMRP) is briefly referenced for justification of the Plan's regional approach (discussed below). Chapter 2 contains description of the Plan elements, the alternatives analysis, and the implementation strategy. Later chapters, especially Chapter 6 ("Biological Environment"), reference the "Draft Report of Suisun Marsh Plan Tidal Marsh Conceptual Model." The chapter appears to be a complete recitation of the conceptual model. While the conceptual model is solid, there is no evidence that it was used to inform the key analyses underpinning the choice of a preferred alternative, or any other important Plan element.

Recommendation: The Plan's claim to a "Science Integration Strategy" is not evidenced. Lacking a clear scientific basis, the alternatives appear somewhat arbitrary and the Plan elements merely derivative of other, poorly referenced plans. At a minimum, the Plan should better explain how it uses that USFWS Tidal Marsh Recovery Plan (TMRP) to determine restoration acreages and locations. Further improvements would reference the Draft Report of Suisun Marsh Plan Tidal Marsh Conceptual Model to describe how tidal marsh restoration in the Suisun region would contribute to life history requirements of species of concern. Finally, an adaptive management plan for guiding restoration and assessing managed wetland enhancements should be produced for the next draft in order to be consistent with the "best available science" principle of the Delta Reform Act.

3. Four region approach

There is weak rationale or scientific evidence provided for the fundamental organizational approach of dividing Suisun Marsh into geographical regions. In one sentence, the Plan claims the four region approach is consistent with the USFWS Tidal Marsh Recovery Plan by "providing the range of environmental gradients necessary to contribute to the recovery of listed species" (pg 2-17). The TMRP is also briefly referenced in a description of the relationship between the SMP and TMRP on page 1-26. This level of detail is inadequate for justifying the approach. As such, the regional approach appears arbitrary and unnecessary.

Recommendation: Improve the explanation of why the SMP divides the Marsh into four regions. If the TMRP is the rationale, then more justification is needed. Alternatively, completely drop the four region approach and appeal instead to best available scientific understanding of landscape ecology in relation to listed species. This approach would consider species conservation relevant issues of landscape scale, patch context, and land-water interface porosity and complexity. The Plan should explicitly consider the life history requirements of listed species and how their growth, reproduction, and survival are affected by landscape attributes and connecting aquatic corridors.

4. Use of Modeling

The three restoration alternatives differ only in acreage of tidal marsh restored and managed wetland enhanced. Compared to the geographic area of Suisun Marsh, the acreage range is rather small. Restoration acreage is bounded by Alternative B that proposes 2-4,000 acres of restoration and Alternative C that proposes 7-9,000 acres of restoration with concomitant reduction in managed wetland enhancement acreage (subtract from 52,112 acres of existing managed wetlands). With non-specific reference to modeling, and no reference to conceptual models or other peer reviewed literature, the Plan claims that the higher end restoration acreage (Alternative C) is unacceptable to landowners because it would be "more difficult to maintain duck populations necessary for heritage hunting in the Marsh and protect species, such as the millions of migratory birds that depend on the managed wetland habitats." Staff has extensive familiarity with the referenced modeling and the statement is difficult to reconcile with information gathered from the modeling analysis. The modeling analysis (covered in Appendix A) did not specifically seek to differentiate between the salinity impacts of the three alternatives. While tidal connections and acreage clearly affect salinity transport in the northern reach of the estuary, the impacts depend entirely on the details of restoration location, tidal connections, and land topography. The range of salinity responses issuing from the restoration design alone likely overwhelms any incremental change due to the narrow range of alternative acreages. While the modeling analysis uncovered many important consequences of tidal marsh restoration location and design, it does not support the claim that the 5-7,000 acre preferred restoration alternative is clearly distinguishable from the 7-9,000 acre alternative on the basis of salinity impacts. The SMP should conduct additional modeling to specifically support the claim.

Recommendation: The SMP should conduct additional modeling to specifically support the claim that the alternatives are distinguishable on the basis of salinity. Further, a thorough sensitivity analysis should be conducted to characterize the relative effects of restoration design on salinity mixing. Finally, the Plan should seek consistency with the Delta Reform Act by demonstrating how changes in Suisun geometry will help to create a more natural salinity regime.

Citations

Deverel, S. J., and S. Rojstaczer (1996), Subsidence of Agricultural Lands in the Sacramento-San Joaquin Delta, California: Role of Aqueous and Gaseous Carbon Fluxes, *Water Resour. Res.*, 32(8), 2359–2367, doi:10.1029/96WR01338.