Summary of Minutes
Dutch Slough Adaptive Management Working Group
Third Meeting
May 26, 2004

Introductory Discussion

Mary Small announced that she will be changing positions at the Coastal Conservancy and transferring her Dutch Slough responsibilities to Jeff Melby of the Coastal Conservancy. Jeff Melby of the Coastal Conservancy briefed the AMWG on the presentation that Mary Small, Michelle Orr and John Cain gave to the CALFED ERP Science Board. Some of the key recommendations of the science board were to:

- Recommended that we use simulation models both in the planning and even after construction begins to improve our understanding and the overall monitoring efforts.
- Recommended implementing restoration all at once rather than sequentially to avoid complications with replication.
- Candid discussion about replication and cautioned against pseudo replication. In general, they didn't think replication was possible but suggested getting around this problem by stronger emphasis on simulation as well as by time for space comparisons using other wetland sites in the Delta.

Michelle Orr emphasized that the main purpose of the meeting was to identify key uncertainties. She reminded the AMWG of the focus on fish and asked for feedback. Peter Baye questioned whether this was all native fish or just salmon. Bruce Herbold said focus on a combination of salmon, splittail, and delta smelt should address multiple native species and encompass a broad suite of habitat and conditions important to native aquatic species. Joan Florsheim asked about how non-fish issues such as subsidence reversal would be addressed.

The AMWG discussed simulation models and their potential application at Dutch Slough. Participants commented that they would be useful for both planning (selection of alternatives) and post implementation to interpret monitoring data and suggest management changes. Emphasis should initially be placed on "simple simulations" rather than complex quantitative models.

Small Group Break Out

<u>Water Quality</u>
The water quality breakout group addressed 3 issues.

1. Transport – trapping salinity and DOC
2. WQ implications of diverting Marsh Creek onto Emerson Parcel.
3. Mercury Methylation.

Mark Stacy presented a conceptual model of tidal trapping and salinity patterns (figures 4 and 5). The break-out group posited that DOC patterns would be similarly impacted to salinity, but Roger Fuji later expressed some reservations about this assumption. Regarding diverting Marsh Creek onto the site, the group concluded that for most constituents such as endrocrine disruptors and pesticides that it probably didn't matter that much because it would largely come with seasonal flood pulses. For copper, on the other hand, we need to be more concerned.

David Sedlack presented a conceptual model (figure 6) for mercury methylation but prefaced the discussion by saying that we are in a very qualitative, conceptual stage. He cautioned that we can't really predict methylation rates from different wetland types. We will need to measure it.

Geomorphology

Michelle Orr presented a template for a conceptual model (figure 2) that started with restoration action, leading to hydro/veg/geomorphic vegetation model; leading to habitat structure, and leading to ecological processes and outcome. Michelle was going to develop further.

Stuart Siegel presented a simple hydro-geo-eco simulation model template (figure 7). It starts with design criteria for desired species, habitats or processes; leading to restoration actions to achieve criteria; geomorphic/veg. structure and evolution; and biological, physical, chemical response to geomorphic structure and evolution. Stuart proposed that the model could be used to conceptually simulate the outcome of various restoration actions and approaches.

The key uncertainties are:

- Cross sectional shapes of the channels
- Weather or not small channels form on the marsh plain
- The influence of vegetation and its role on accretion and channel network
- The overall rate of accretion

These uncertainties are a function of:

- Sediment supply
- Elevation
- Climate change/sea level rise
- Tidal energy/tidal range
- Salinity changes
- Whether marsh creek is diverted
- Where breaches are located. Whether there is one or two breaches.
- Subsidence and compaction.
- Relationship between grain size, salt, flocculation, and processes of deposition and scour (could be influenced by fill vs. onsite grading).

Fish

Bruce Herbold referenced fish model (figures 3A,B) and highlighted uncertainties for fish.

- Will fish be more habitat limited or more trophic limited. Will the food supply into the channel from the marsh plain of value or is it that the habitat in the channel provides foraging area for the fish and sufficient food supply. So are they habitat limited or food limited. This boils down to how much the marsh plain effects the fish vs. the channel. He thought this was a key question for Dutch Slough.
- Secondly, what are the habitat values of different depths of channels, different sizes of channels.
- Thirdly, with the array of plants available, what are the different habitat values of native vs. exotic SAV, emergent vegetation of various sources.
- Lastly, how can we assure that access from the larger world to Dutch Slough is adequate. How do we connect the fish migration corridors of Sacramento and San Joaquin Corridors. How do the fish know Dutch Slough is there.

Birds

Last but not least, John Takekawa presented on birds. One uncertainty is how piscivorous birds work in a system likes this. How will vegetation effect these birds, or how birds are effected by channel differences, water depths, or other habitat factors. With regard to waterfowl, we need to consider different habitat elements for different life cycle functions.

Selected Key Uncertainties

The AMWG identified the following key uncertainties at the end of the meeting.

1. Are native fish limited by habitat or food or predation or contaminants?
2. What are the important characteristics of dendritic channel v. open shallow water habitat for fish?
3. What are the values of large channels vs. small channels for fish?
4. What is the value of large order channel networks vs. small order channel networks?
5. What are the benefits to fish of dendritic channel networks and adjacent marsh plains vs shallow open water?
6. Is there a relationship between tidal channel density and fish utilization?
7. What are the fish habitat values for different aquatic plants that we can expect on the site?
8. What is the relative ecological benefit of high marshplain vs. low marshplain?
9. What is the transport connection between marshplain and channel?
10. Is marshplain elevation limited by sediment supply, peat accumulation, tidal range, initial elevation, and/or subsidence and compaction?
11. What factors influence slough channel development and sustainability?