

ISP Update 2005

With the return of warm summer weather to the South Bay, the South Bay Salt Pond Restoration Project is once again working to address low levels of dissolved oxygen in some of the shallow ponds in the southern and eastern shore of the project. Low levels of dissolved oxygen were first reported last year when monitoring revealed that some of the ponds near Alviso, which were opened to the Bay in the summer of 2004, were releasing low levels of dissolved oxygen at low tide to the Bay and sloughs. If left unchecked, the release of water with low dissolved oxygen could affect the health of fish and other aquatic species in the Bay.

The fluctuation in dissolved oxygen appears to be diurnal, with oxygen levels dropping during the evening and night time and rising again during the day due to algae photosynthesis. We believe the problem becomes pronounced during warm summer months because the higher temperature of the ponds' water and the longer hours of daylight combine to increase the growth of algae in the summer. It is not a problem in the winter with lower water temperatures and fewer hours of daylight.

As the Initial Stewardship Plan moves forward and more ponds are open to tidal action, we are using a combination of strategies to ensure the ponds do not negatively affect oxygen levels in the rest of the Bay. Because many of these strategies have not been tested before, we continue to closely monitor their effectiveness in resolving the dissolved oxygen issue. We will apply the lessons learned from this experience to help resolve similar issues in the long term restoration and pond management plan. Current strategies include:

1. Baffles- Baffles redirect the flow of water away from areas of the pond with high levels of dissolved oxygen and toward the tide gate that discharges water to the Bay. This prevents the release of water to the Bay from sections of the ponds with low levels of dissolved oxygen. Extensive testing of the ponds' dissolved oxygen levels has revealed that most of the ponds' water has acceptable levels of dissolved oxygen. This accounts for the abundance of wildlife using the ponds including fish eating birds such as American white pelicans, double crested cormorants and terns. However, we have discovered that the deepest sections of the ponds (usually the dredge channels/barrow ditches along the inside of the levees) contain water with higher salinity and lower levels of dissolved oxygen than the rest of the pond. By preventing the release of water from the deepest parts of the ponds, we can prevent water with the lowest levels of dissolved oxygen from reaching the Bay.

2. SolarBees- The Bees, which run on solar power, aerate the water by providing a steady mixing action in the pond. The Solar Bees mix the low dissolved oxygen areas of the ponds (the barrow ditches) with the high dissolved oxygen areas (the majority of the pond) resulting in a higher average of dissolved oxygen flowing from the ponds to the Bay.

3. Muting the Tide Gates- Currently, the ponds are operated as continuous circulation systems using tide gates. These water control structures bring water from the Bay into one pond only at high tide and discharge water from another connected pond (or the same pond in a muted tidal system) back to the sloughs and/or directly to the Bay only at low tide. In an effort to raise the oxygen levels of the ponds, project managers are increasing intake and discharge volumes by operating some of the water control structures to both take in water at high tide and discharge it back to the Bay at low tide. By increasing the exchange of water from the ponds and the Bay, managers hope to increase the amount of oxygen in discharge waters so that it meets the level set by the Regional Water Quality Control Board. These measures, as described in the operations plan, may be part of the suite of actions that can be used to achieve water quality objectives.

4. Closing the Tide Gates during the nights with the greatest amount of discharge from the ponds to the Bay- The ponds are operated to release water to the Bay at low tide. Because the tide cycle varies each day of the month, some low tides occur at night when the ponds naturally experience low levels of dissolved oxygen. It is possible to prevent the bulk of the release of low oxygenated water to the Bay by closing the tide gates during those nights of the month with the lowest tides. By closing the ponds' tide gates for a week to ten days at a time, especially during neap tide periods, we can eliminate the largest releases of low oxygenated water each month. However, this may not be a viable long term solution, because closed pond systems can allow the salinity of pond water to rise due to wind and solar evaporation. One of the goals of the Initial Stewardship Plan is to *reduce* the salinity of the pond system in preparation for long term restoration.

Current Status

August 3, 2005

Monitoring reveals that dissolved oxygen levels have been declining for the later part of July on both the Refuge pond systems (managed by the US FWS) and on one of the Ecological Reserve ponds (managed by the CA DFG). In coordination with the Regional Water Quality Control Board, this spring the Refuge installed a baffle system in Pond A3W which significantly increased the level of oxygen being released from that pond to Guadalupe Slough. Based on this success, the Refuge has ordered a new baffle system to be installed in Pond A14 to address low dissolved oxygen issues that seem to be similar to that what was found on Pond A3W last year. The Refuge has also installed SolarBees on Pond A7 to test their ability to mix the pond water thereby increasing the oxygen level in the water being discharged to Alviso Slough.

Project managers are evaluating the potential impacts to nesting birds from opening Pond A16 to muted tidal action. This action will be implemented if managers determine that there will be no adverse impact to the birds. They have also closed the Pond A2W system for a period of approximately 10 days to prevent night time releases of low oxygenated water.

In the Eden Landing area, the pond 11, 2A and 8A systems are operated under muted tidal conditions. In coordination with the Regional Water Quality Control Board, the CA DFG has also temporarily closed the pond 2C and 8A systems during neap tide periods and other occasions to prevent low oxygenated water from discharging into the Bay. The pond systems are continuing to provide very good roosting, nesting and foraging conditions for waterbirds, and early migrant species such as western sandpiper and medium-salinity salt pond specialist species such as red-necked phalarope are being observed in high densities recently over various periods and within various portions of the ponds. Observations of thousands of these and other waterbirds indicate that the ponds continue to provide suitable habitat conditions.

August 11, 2005

Refuge managers have opened the tide gates on Pond A16 in response to a sudden rise in fish mortality inside the pond. They are monitoring water quality inside and outside the pond to determine the next course of action. We expect to post an update on this situation by Tuesday August 16th.