Agenda Item No. 16

File Code No. 570.05

CITY OF SANTA BARBARA

COUNCIL AGENDA REPORT

AGENDA DATE: June 4, 2013

TO: Mayor and Councilmembers

FROM: Administration Division, Parks and Recreation Department

SUBJECT: Andrée Clark Bird Refuge Status Report

RECOMMENDATION:

That Council receive a status report on the Parks and Recreation Department's projects to address vegetation maintenance and water quality improvement at the Andrée Clark Bird Refuge.

DISCUSSION:

The Andrée Clark Bird Refuge (Bird Refuge) is a 42-acre open space park that provides passive recreation opportunities in the East Beach neighborhood. Bordered on the south and east by Cabrillo Boulevard, the park includes 29-acre lake, trails, a small parking lot, and a section of the multi-modal beach way.

The park provides habitat for over 200 species of birds and is a well-known wildlife viewing area in the South Coast. The lake includes three islands that support breeding and roosting birds and haul-out locations for the southwest pond turtle, a California Species of Concern. Historically, the Bird Refuge area was a salt marsh, receiving fresh water from Sycamore Creek. However, construction of the railroad in the 1880's resulted in rerouting Sycamore Creek, thereby isolating the salt marsh. The City purchased the property in 1909 as a park. In 1929, Huguette M. Clark donated $50,000 to provide a refuge for migrating birds and named the lake for her sister. The lake is now an artificially modified estuary that supports emergent wetlands.

The 844-acre watershed is predominantly urban (large lot residential) but also contains a golf course, tennis courts, a portion of the Zoo, and a cemetery. Runoff from the watershed, including roadways, enters the lake via a mix of open channels and storm drains. The lake is connected to the Pacific Ocean through a tidegate system located adjacent to the north side of Cabrillo Boulevard and passing under that roadway. A closed weir gate in the outflow channel separates the lake from a coastal lagoon.

Water Quality Issues at the Bird Refuge

High nutrient levels in the water, poor water circulation, and low levels of dissolved oxygen are key water quality issues at the Bird Refuge. The sediment in the lake is also nutrient laden and the water levels vary from three to five feet. These conditions have historically caused periodic lake eutrophication. Eutrophic conditions, an increase in algal growth and die-off, as well as the turnover of anaerobic sediment, leads to the release of noxious odors. The most recent event occurred in June 2012. Over the years, the City has investigated a range of potential solutions. The Department has pursued a number of methods to address these conditions, with varying degrees of temporary success. A long-term solution to water quality is needed to improve the ecology of the Bird Refuge.

Vegetation Maintenance and Restoration Project

The Parks and Recreation Department (Department) initiated the five-year Vegetation Maintenance and Restoration Project (Project) at the Bird Refuge in January 2012. The purpose of the project is to improve water flow and conveyance into and within the lake, and reduce the potential for mosquito production and flooding. Conditions in the Bird Refuge can support high summer populations of mosquitoes and a corresponding increased threat of West Nile Virus. During significant storm events, flooding can occur on Old Coast Highway, Highway 101 and Cabrillo Boulevard.

The first year of the project included the removal of 0.94 acres of emergent vegetation from designated areas. During the first and second years of the project, the Department began restoration of 0.86 acres of native habitat within the park. The project includes ongoing maintenance of the areas where vegetation has been removed and habitat that has been restored. Restoration is required to offset the habitat that is removed.

Water Quality Pilot Project

In September 2012, the Department began a pilot project to test the ability of enhanced circulation to improve water quality and prevent noxious odors. The area near the tide gate (outlet arm) was chosen as the test location due to its isolation from the larger lake area. Perforated tubing was installed along the bottom of the lake in the outlet arm. Compressed air from the tubing provides micro-aeration, designed to increase vertical and horizontal circulation. Increased circulation is predicted to increase dissolved oxygen levels throughout the water column and to disrupt stagnant conditions that can lead to noxious algal blooms.

Preliminary results show that the pilot project is creating a significant difference in circulation and dissolved oxygen concentrations. However, it is still too early to determine if the difference is great enough to prevent noxious odors developing in the hot summer months. The Department will continue to monitor the benefits of the pilot project. A possible next step is to add beneficial microbes to the water column, in an effort to increase degradation of organic material on the lake bottom and increase water depth. If water depth can be increased to seven feet, additional circulation options will become available.

Long-term Water Quality and Habitat Restoration Program

The Department's proposed Fiscal Years 2014-2019 Capital Improvement Program (CIP) includes a project to design and implement a comprehensive program to improve water quality and enhance native habitats of the Bird Refuge. In addition to poor water quality, issues to be addressed include sedimentation, habitat restoration, tidal influence and flood management. The first step of the program is to evaluate different water quality improvement techniques. The pilot program that began in Fiscal Year 2013 would continue in Fiscal Year 2014. It is anticipated that this will subsequently lead to larger scale technical feasibility assessment, preliminary design and initiation of environmental review in Fiscal Year 2015 and Fiscal Year 2016. It is anticipated that management activities would be implemented over a number of years to develop a long-term sustainable approach to maintain acceptable water quality and vegetation habitats, improve the ecological function of the lake, and enhance recreation.

BUDGET/FINANCIAL INFORMATION:

The total Parks and Recreation General Fund appropriation for the Bird Refuge Vegetation Maintenance and Restoration Project is $403,352, which includes project design, permitting, construction, and monitoring for five years. A total of $309,824 has been expended to date. The remaining $93,528 will continue project implementation.

Expenditures for the Water Quality Pilot Project include $10,246 of Measure B funds for the purchase of the circulation equipment. Parks Division and Creeks Division staff is responsible for project implementation, including installation, maintenance and monitoring.

The Fiscal Year 2013 Creeks Capital Fund includes $150,000 for long-term water quality and habitat restoration for the Bird Refuge. In order to design and implement a comprehensive water quality and habitat restoration program, the proposed Creeks Capital Improvement Program (CIP) for Fiscal Year 2014-2019 recommends an additional $1.35 million in Measure B funds and $750,000 in grant funds over six years, for total funding of $2.25 million.

SUSTAINABILITY IMPACT:

The Bird Refuge provides habitat for over 200 species of birds and other wildlife. Improvements to Bird Refuge will enhance water quality and wetland environments, increase public safety, and preserve public park resources.

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APPROVED BY: City Administrator's Office

Parks & Recreation
Enriching People's Lives

Andrée Clark Bird Refuge Status Report

Santa Barbara City Council

June 4, 2013

Andrée Clark Bird Refuge

- 42-acre park with a 29-acre lake, trails, parking lot, and beach way
- Constructed in 1929 with a $50,000 donation from Huguette M. Clark
- Provides habitat for 200 species of birds, southwestern pond turtle, fish
- Artificially modified estuary with brackish wetlands

Management Challenges

- Poor water quality
  - High nutrient in-flow, limited circulation, low levels of dissolved oxygen
- Shallow depth, nutrient laden sediment
- Dense marsh vegetation contributes to mosquito production
- Flooding during significant storm events, high rainfall
- Eutrophic conditions and sediment turnover events results in noxious odors

Vegetation Maintenance and Restoration Project

- Five-Year Permit
  - U.S. Army Corps of Engineers, U.S. Fish and Wildlife, CA Coastal Commission, CA Fish and Wildlife, Regional Water Quality and City of Santa Barbara
- Flooding, water conveyance, mosquito management
  - Removal of emergent vegetation from designated areas
  - Restoration of native habitat
- Short-term approach while developing long-range water quality and restoration plan

Viewing Platform - Before

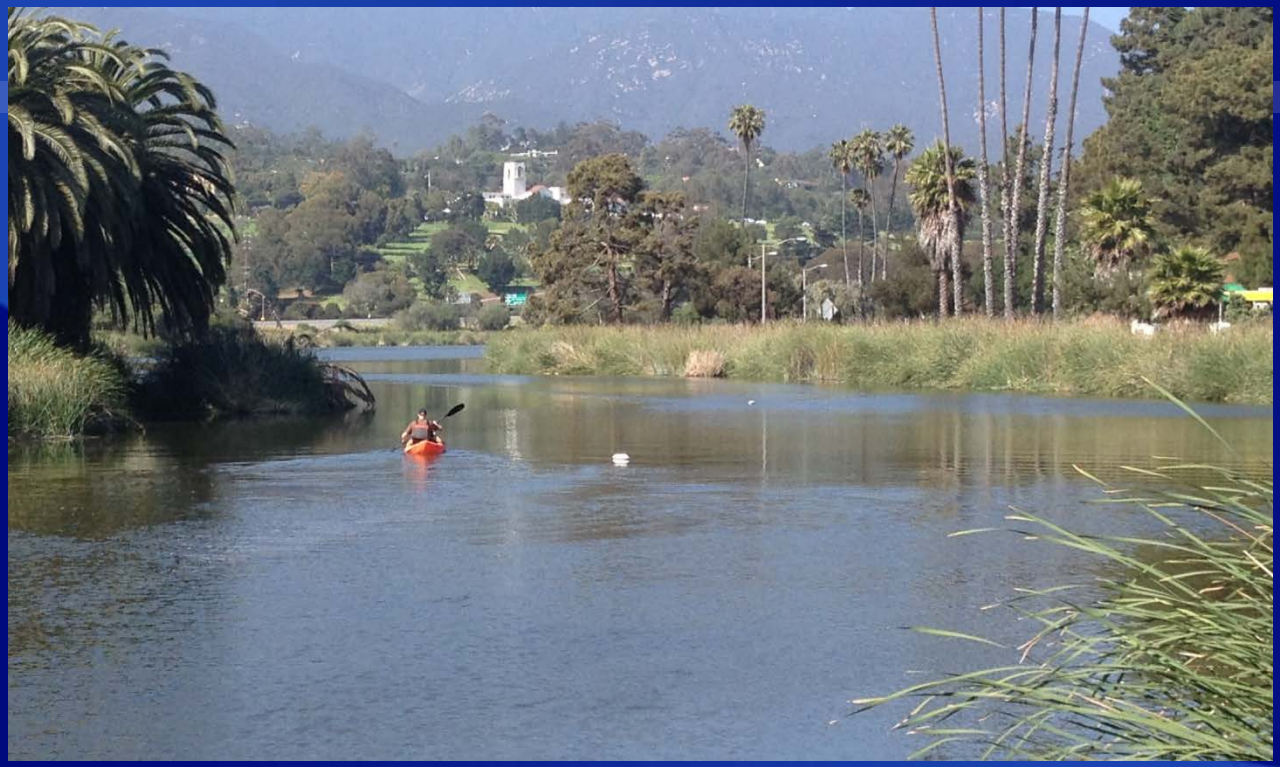
Viewing Platform - After

Native Habitat Restoration

Water Quality Pilot Project

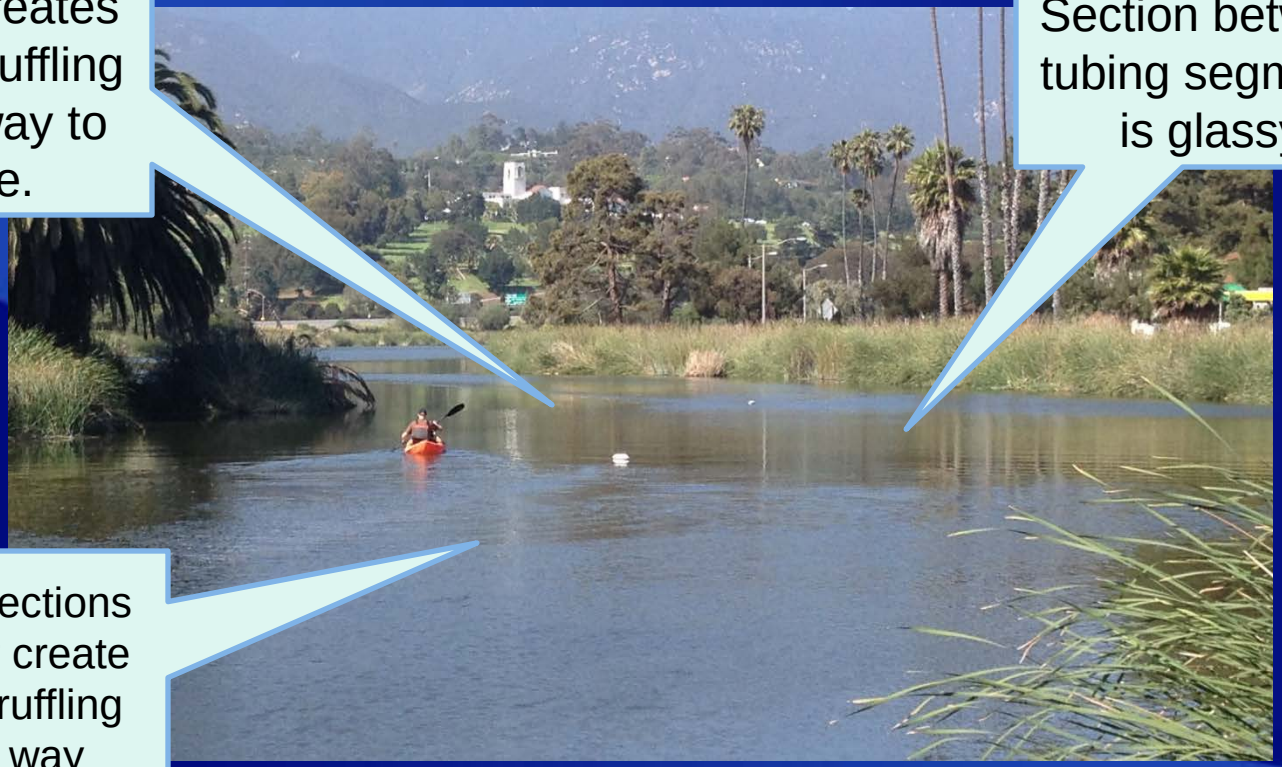
- Purpose - Test enhanced circulation to improve water quality and prevent noxious odors
  - Perforated tubing and compressed air
- Results - Significant difference in circulation and dissolved oxygen concentrations
- Next Step – Continue monitoring, add beneficial microbes

Perforated tubing and compressed air create horizontal and vertical circulation.



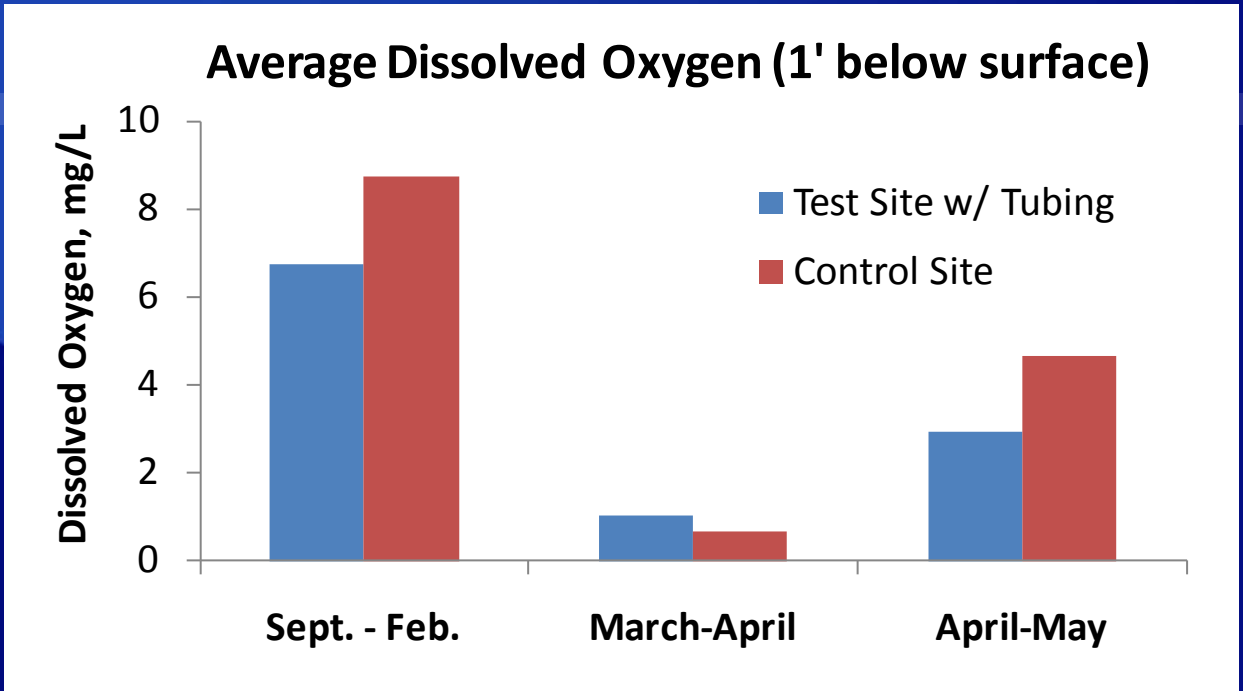
Staff monitor oxygen levels weekly in pilot test area and control area.

Aeration in center creates surface ruffling all the way to shore.



Section between tubing segments is glassy.

Tubing sections in center create surface ruffling all the way across.

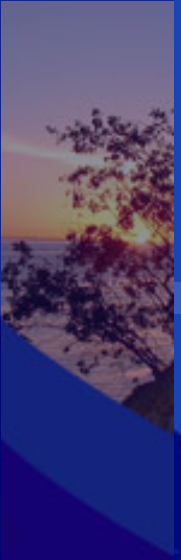


Increased circulation shown by:

- Low-oxygen bottom water brought to surface during periods of high average oxygen.
- Higher-oxygen surface water mixed to bottom when average dissolved oxygen is low (middle section).

Fiscal Years 2014-2019 CIP

- Design comprehensive program to improve water quality and enhance native habitats of the Bird Refuge
- Implement over a number of years
- Achieve long-term sustainable approach
- Proposed Measure B and grant funds of $2.25 million



QUESTIONS?