

ES&P 400 and the Los Cerritos Wetlands

Executive Summary

This report analyzes the integrated aspects of chemical, biological, economical and political dynamics that impact the Los Cerritos Wetlands which is a vital resource for southern California and the City of Long Beach. This area is classified as a tidal estuarine salt marsh, and is located on the border of Seal Beach and Long Beach, adjacent to Los Alamitos Bay.

A bird survey of the wetlands found 46 species including 19 Belding's savannah sparrows and four least terns which are both endangered. Based on bird species richness and abundance, the wetlands appear to be a viable ecological community. Our 2006 survey of the Los Cerritos Wetlands shows that total abundance and bird species richness have declined since 1980. However, our data indicates that higher abundances may have been found with more observation hours. Shorebirds, especially sandpiper species dominated the types of birds observed due to the large mudflat habitat. This resulted in low species evenness. The smallest group represented was the top consumers in the food web, the raptors. Two endangered species, the Belding's savannah sparrow and least tern were both observed with higher overall numbers than reported in previous studies. Our data indicates the wetlands still contain a healthy ecological community. Certain measures should be taken to protect and provide for bird use including gates for protection and a walkway for bird watching. Future research should include comparing abundances from surrounding wetlands or fish, invertebrate, and plant abundances.

The sum of PAH contamination ranges from 58.4 ng/g to 37,580.32 ng/g among the four sample sites and sample depths. The fractional compositions of all sites except for MC-D are characteristic of combustion vehicle traffic sources. Although no statistical analysis was performed against literature data, the ratios are within their respective error limits of a uniform 20% error (Li, et al. 2003). This may reflect contamination of site MC-D by the degraded wetland (Bixby oil production sites).

Determinations were made on the effects of the AES Power Plants intake systems on the adjacent wetlands ecosystems. Numerous past attempts to purchase and/or restore the wetlands are described as well as possible mitigation funds from several agencies (i.e. Ports of Long Beach and Los Angeles). An economic valuation survey was conducted to determine the amounts the local adult population would be willing to pay (WTP) for three separate restoration plans for the Los Cerritos Wetlands and the adjacent land parcels. The economic regression analysis based on the research concluded from the survey found the average amount an adult person is WTP in additional taxes per year for Phase 1, 2, and 3 of the restoration plans is between \$32.44 and \$44.66.

Table of Contents

Chapter 1.....	Biology
Chapter 2.....	Economics
Chapter 3.....	Environmental Chemistry
Chapter 4.....	Policy
Chapter 5	Conclusions

CHAPTER 5

Conclusions

Environmental Chemistry

The distribution and potential sources of Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), and pesticides within the Steam Shovel Slough must be determined in order to formulate effective restoration projects and management policies. The quantitation of priority PAHs, PCBs, and pesticides is essential to the development of Total Maximum Daily Loads (TMDLs) for the Los Cerritos Channel and Alamitos Bay, that will minimize the adverse impacts of these pollutants on the salt marsh ecosystem in terms of functionality, and species richness and abundance. The sum of PAH contamination ranges from 58.4 ng/g to 37,580.32 ng/g among the four sample sites and sample depths. The fractional compositions of all sites except for MC-D are characteristic of combustion vehicle traffic sources. Although no statistical analysis was performed against literature data, the ratios are within their respective error limits of a uniform 20% error (Li, et al. 2003). This may reflect contamination of site MC-D by the degraded wetland. PAHs that infiltrate the area will only occur during the outgoing tide, and it is therefore logical to assume that contaminants from the oil drilling source are distributed away from the Steam Shovel Slough. Unfortunately, no sample sites were analyzed from this area, and such comparisons may not be made at this time. There is little correlation between the distribution of PAHs among site MC-D and the other locations, except for the decreased fractional composition of Benzo fluoranthenes among the top sediments of site MC-D and MC-C relative to deeper sediments. The non-detection of analytical contaminants in the water samples is thought to be due to the absence of significant storm water influences during sample collection, and the continuous operation of the AES power plant cooling towers.

Team Bio

Based on our survey, the Los Cerritos Wetlands are a viable habitat for a healthy bird community. Compared to previous studies, there seems to be a decrease in viable habitat and a resulting decrease in certain types of bird species. To maintain the wetlands as a viable habitat and decrease any further degradation, we recommend that certain measures be taken to protect and provide for bird use. We recommend the building of gates to protect nesting birds from urban pet predation and possibly a Belding's savannah sparrow and least tern nesting preserve. To minimize human impacts we suggest creating a walkway with bird observation points to promote low-impact bird watching.

Our suggestions for future research include comparing bird abundances from Los Cerritos Wetlands to surrounding wetlands to determine possible relationships between bird abundances and habitat type. Other important aspects of wetland biology include fish, invertebrate, and plant abundances. All parts of the ecosystem are involved in providing a healthy community as well as the geologic, hydrologic, and social systems.

Team Economics and Policy

Findings were made on the effects of the AES Power Plants intake systems on the ecological environment of the Los Cerritos Wetlands. Our research also found past attempts to purchase land to restore and/or economically develop the wetlands, as well as information regarding political and industrial participants in any restoration/developing efforts that have been attempted or may be attempted in the near future. Information has also been provided showing possible mitigation funds that have been set aside by the Port of Long Beach, Port of Los Angeles, Southern California Edison, and the Wetlands Recovery Project.

An economic regression analysis was conducted on a subsection of the local adult population residing around the Los Cerritos Wetlands. Our research team came to these economic conclusions:

- The average amount a person is WTP in additional taxes per year for restoration work on the wetlands area designated as Phases 1, 2, and 3 in our report is between \$32.44 and \$44.66.
- The average amount a person is WTP in additional taxes per year for Phases 1, 2, and 3 for every \$10,000 increase in income is between \$0.66 and \$1.66.
- The average amount a person is WTP in additional taxes per year for Phases 1, 2, and 3 for every increased level of education is between \$0.46 and \$2.42.
- The average amount a person is WTP in additional taxes per year for Phases 1, 2 and 3 increases by a dollar number between \$21.18 and \$27.18 if they belong to an environmental group.
- The average amount a person is WTP in additional taxes per year for Phases 1, 2, and 3 decreases between \$0.13 and \$0.15 per additional year of age.
- The average amount a woman is WTP in additional taxes per year for Phases 1, 2 and 3 is between \$10.11 and \$12.15 more than a man would in similar circumstances.
- The estimated amount the adult population of Long Beach and Seal Beach are WTP in annual taxes (based partly on the averages of the exogenous variables plugged into the formula $y = B_0 + B_1x + B_2z$) for Phases 1, 2, and 3 is between \$14,089,490.40 and \$16,345,113.76.