

Beneficial Uses of the Los Cerritos Wetlands Complex

Economic Introduction

Our objective is to provide a baseline of beneficial uses existing in the wetlands today and if the Los Cerritos Wetlands were restored, what uses they could provide. Assessing the potential and existing benefits of the Los Cerritos Wetlands is an integral part of an economic assessment of the benefits of enhancing the environment. Our observations can be used as information for a contingent valuation (CV) survey to estimate the benefits of restoring/enhancing the Los Cerritos Wetlands Complex. In order for a CV survey to allow a reliable and valid estimate of benefits, a questionnaire should incorporate all aspects of a hypothetical market. For contingent valuation, the description of the hypothetical market should include the baseline amount of the good and the existing beneficial uses that aid in explaining the baseline. Part of our methods will be delving into possible beneficial uses that may not have been categorized by previous groups, but that need to be considered when weighing the options for the Los Cerritos Wetlands. In establishing beneficial use designations, we used a list devised by the California's Regional Water Quality Control Boards (CRWQCB).

For balanced observations, we divided the Los Cerritos Wetlands complex into a number of different locations (sites). The Economics Team spent equal time at each site; visiting at different times during the day in order to experience various types of activities. Due to the class scheduling, the team was not be able to observe seasonal variation of beneficial uses. An excel datasheet was used to compile all the observations into one cohesive table showing all the sites and listing the various uses. Using this data, we created a GIS map to show relevant surrounding areas, compare geographic features, and create a visual for the table. The GIS map provides a visual answer to the question, 'Which site should be restored or enhanced first, based on its existing and potential uses?' Our hope is that future ESP 400 teams, survey respondents, and other organizations will have a better idea of what the wetlands as a natural resource provides to the public at large, especially to nearby residents.

The Economics Team analyzed the CV survey and questionnaire design developed by the Environmental Science and Policy Economics Team in 2006. Our group examined the methodologies used to determine who to interview, where the interview took place, how the interview was given, duration of the interview, and how interviewer bias was kept to a minimum. We critically analyze the visual aids used in the questionnaire for clarity, purpose, effectiveness, and cognitive simplicity. The overall objective in this critique is to provide future ESP 400 students with the basis for refining the CV questionnaire and survey.

By integrating natural sciences through using scientific methods of observation, and the social sciences through GIS mapping and economic analysis, we hope to positively affect environmental policy.

Methods

The Economics Team focused on the entire Los Cerritos Wetlands Complex, observing at nine of the ten sites that the Biology Team used, and two other sites. The sites included: Colorado Lagoon, Sims' Pond, Jack Dunster Marine Reserve, Steam Shovel Slough, Shopkeeper's Pond, Marketplace Marsh, Campgrounds Site, Callaway Marsh, Zedler Marsh, Tongva Pond, Gum Grove Park and the Hellman Deed Restricted Property (see Appendix A). The Biology Team also monitored Melissa's Degraded Site, but in our observations we surveyed

the beneficial uses of this site in congruence with Steam Shovel Slough because they were adjacent.

The group conducted an assessment on beneficial uses and its economic potential of the Los Cerritos Wetlands. The designated beneficial uses and their definitions came from the CRWQCB for Designations and Water Quality Assessments¹ (see Appendix B. for a list of definitions of the designated uses). We received feedback from people interviewed at the sites on their opinion of the beneficial uses of the various sites within the Los Cerritos Wetlands Complex.

Team members went out to 8-12 different sites and spent 15-20 minutes at each site per visit. Various days and times for visiting were arranged to get a comprehensive view of the sites (see Appendix C. for specific dates and times). The goal was to visit each site, observe, and document each site for 2 hours.

Brief Description of Site & Significant Observations

Colorado Lagoon



Colorado Lagoon is located at 5119 E. Colorado St., in Long Beach, CA 90814. Colorado Lagoon is one of the last remaining wetlands in Long Beach and it receives its water from the incoming tide and from urban runoff with 11 different storm drains leading into the lagoon. The ocean water travels from the sea, to Marine Stadium, beneath the streets, and then narrowly enters the lagoon through tide gates that now allow for constant tidal influence. There is a possibility that in the future, the storm drains will not be allowed to flow into the lagoon and an above ground channel will be built to allow more ocean water to flow into the lagoon, thereby increasing water circulation.² The Colorado Lagoon is a landmark in Long Beach and the non-profit organization, Friends of Colorado Lagoon, is focused on preserving the lagoon for future generations.³

Colorado Lagoon is a popular place for recreational activities, both in and out of the water. In the summer time, visitors swim and wade in the lagoon, even though the water may not be very safe due to the urban runoff and the lack of sufficient water circulation. The water has tested positive for lead, zinc, chlordane, and PAHs in the sediments, and organochlorine pesticides (chlordane, DDT, dieldrin, and PCBs) have been found in the tissues of fish and mussels. Since 2001, the city of Long Beach Health Department has been conducting weekly surveys of indicator bacteria, and high levels of bacteria have also been measured in the lagoon. In the past; the lagoon has been closed to swimmers due to unsafe water conditions. Heal the Bay has given the north shore of the lagoon a grade of D or worst, and in 2004 the Natural Resources Defense Council named the lagoon the worst place to swim



¹ http://ceres.ca.gov/wetlands/geo_info/so_cal/terms_definitions.html#RWQCB

² Taylor Park, volunteer for the Colorado Lagoon (4-28-07)

³ http://www.coloradolagoon.org/Menu_page.html

in Long Beach.⁴ No wonder the lagoon has a nick name of “polio pond.”⁵

Beneficial uses of the lagoon include to picnicking, sunbathing, fishing, combing the beach for sea shells, walking, cycling, bird watching, sightseeing, and building and playing with model boats. The lagoon is a migratory destination for many birds and it serves as breeding grounds and a nursery for marine organisms.⁶ It is home to the endangered species of bird, the California Least Tern.⁷ On site there is the Colorado Lagoon Wetland and Marine Science Education Center where visitors can go on guided nature walks, learn about marine organisms and the lagoon, participate in lagoon clean up days, and take part in volunteer activities.⁸



Sims' Pond Biological Reserve



Sims' Pond Biological Reserve is located at the corner of Pacific Coast Highway and Loynes Drive in Long Beach, and it is adjacent to the Del Lago housing community.⁹ The California Coastal Commission agreed to allow homes to be built around Sims' Pond under the stipulation that Sims' Pond be preserved as a biological reserve (1979) and that the Del Lago and Bay Harbour Homeowners Associations own and maintain it, under the guidance of the Department of Fish and Game. In 2003, the Homeowners

Associations deeded the pond to the city of Long Beach, and the city's Department of Parks, Recreation and Marine now maintains it.

Sims' Pond was originally a salt-water marsh fed by sea water, but due to development, it is now a fresh-water pond fed by urban runoff from the community and the golf course next

⁴ <http://www.longbeach.gov/civica/filebank/blobdload.asp?BlobID=5245>

⁵ Charles, maintenance man at Colorado Lagoon

⁶ ESP 400, Econ team field observation

⁷ Eric Zahn, CSULB Professor

⁸ http://www.coastal.ca.gov/publiced/directory/resdirectory/f_orgs/friendsofcoloradolagoon.html

⁹ <http://www.dellagohoa.org/>

door.¹⁰ Sims' Pond is named after the pond that was used by "Sims' Bait Shop" years ago. It covers about six acres and is a refuge for various bird populations, like ducks, egrets, and Great Blue herons.¹¹ It also plays host to migratory birds. Sims' Pond is home to turtles, catfish, mosquito fish, bull frogs, some endangered species of birds, and other critters.¹² There are native and non-native plant species living in and around the pond.

Sims' Pond is closed to the general public and even to the people living in the Del Lago housing community. The Los Cerritos Wetlands Stewards, Inc., a non-profit environmental organization, maintains the pond and gives guided tours.¹³ The Stewards are focused on educating the community and getting them involved with the preservation of Sims' Pond and the Los Cerritos Wetlands.¹⁴ Beneficial uses of the pond include walking, bird watching, sightseeing, and learning about wetlands.¹⁵



Jack Dunster Marine Biological Reserve



Jack Dunster Marine Biological Reserve is located on Boathouse Lane near the Pete Archer Rowing Center at Marine Stadium in Long Beach. Jack Dunster is a 2.7 acre site composed of 1.5 acres of land and 1.2 acres of shallow water built on the northwesterly side of the Los Cerritos Channel.¹⁶ The Marine Advisory Commission and the Parks, Recreation and Marine Department of Long Beach played a role in establishing Jack Dunster as a place

¹⁰ Eric Zahn, CSULB Professor

¹¹ ESP 400, Econ team field observation

¹² <http://www.gonebirdwatching.com/destinations/california/sims-pond-reserve.asp>

¹³ <http://www.dellagohoa.org/>

¹⁴ <http://www.lcwstewards.org/lcws/index.html>

¹⁵ ESP 400, Econ team field observation

¹⁶ http://www.ci.long-beach.ca.us/park/facilities/parks/jack_dunster_marine_biological_reserve.asp

for recreational and educational opportunities.¹⁷ There is a meandering pathway through the reserve, which allows for public access, and the pathway is landscaped with native Californian plants.¹⁸ There are two floating observation platforms and a floating dock.^{17, 18} There is a low, bluff-like retaining wall which protects the land from erosive currents in the Los Cerritos Channel and it protects the reserve from upland urban runoff.^{17, 18} The central area of the reserve was excavated to provide for a tidal marsh habitat.¹⁷ A floating breakwater protects the area by reducing the impact of erosive currents.^{17, 18}

The Beneficial uses of Jack Dunster include walking, cycling, sightseeing, bird watching, and sea lion watching (Waldo, the sea lion loves to hang out at the reserve).¹⁹ There are many opportunities to participate in educational activities, such as planting native vegetation and learning about this type of marine habitat.¹⁸ Jack Dunster is home to the endangered California Least Tern.²⁰ The surrounding area of the Los Cerritos Channel and Marine Stadium are great for other recreational activities such as boating, kayaking, and rowing.¹⁸



Steam Shovel Slough



Steam Shovel Slough is located in the Los Cerritos Wetlands area and it is adjacent to the Los Cerritos Channel and Studebaker Road in Long Beach. The slough is tidally influenced because the Los Cerritos Channel feeds ocean water into it.¹⁸ The slough is approximately 650 meters long (2,132.55 ft) and surrounded by Bixby property which is fenced off.¹⁸ The slough is the only true remaining “salt water wetland” in the Los Cerritos Wetlands area because it is less degraded than the other sites and because has tidal flow on a daily basis.^{18,18}

¹⁷ http://www.ci.long-beach.ca.us/park/facilities/parks/jack_dunster_marine_biological_reserve.asp

¹⁸ ESP 400, Econ team field observation

¹⁹ <http://www.lcwstewards.org/lcws/Projects/jackdunster.html>

²⁰ Eric Zahn, CSULB Professor

Steam Shovel Slough is composed of salt-marsh habitat, is home to many species of shore birds and marine organisms, and is a refuge for many migratory birds.²¹ It is home to endangered species such as the California Lest Tern, Belding's Savannah Sparrow, and the Wondering Skipper (a moth).²² The Beneficial uses of Steam Shovel Slough include kayaking (at high tide), bird watching, sightseeing, and educational activities. The beneficial use of commercial, industrial, or residential development would not be allowed because the slough is considered a wetland.

The number of beneficial uses could increase if the private land around the slough is purchased and enhanced by the state or a non-profit environmental organization like the Los Cerritos Wetlands Authority. If the surrounding area was open to the public, then the community would benefit from there being more "open space" and more recreational opportunities like walking, hiking, and cycling.



Shopkeeper's Pond



Shopkeeper's Pond is located on 2nd Street, across from Shopkeeper Road and the Marketplace Shopping Center in Long Beach. The site where the pond is located belongs to the Bixby family and is fenced in. The water that fills up the pond most likely comes from urban runoff. The pond is home to birds, such as ducks and egrets, and an array of wetland vegetation. Migratory birds may also utilize this pond between destinations.²¹

The beneficial uses of Shopkeeper's Pond are limited to bird watching from behind the fence because it is private property. If the property was purchased and enhanced by the state or a non-profit environmental organization, then the recreational uses of the pond could increase to activities like walking, biking, bird watching,

²¹ ESP 400, Econ team field observation

²² Eric Zahn, CSULB Professor

picnicking, etc.²³ Shopkeeper's can also serve as a good educational resource for the community. In terms of abundance of bird species that were viewed around the area, Shopkeeper's was one of the most active sites for birds and wildlife.



Marketplace Marsh

Marketplace Marsh is located on 2nd Street, adjacent to the Marketplace Shopping Center in Long Beach. It is tucked away on the southern end of the Bixby-owned property that is dotted with oil derricks throughout the site. Since this is privately owned land, entrance into this site is limited, as are many other sites that the Economics Team visited. However, a fence located just outside of the Trader Joes parking lot provides easy access when opened onto the dirt/gravel road that borders the marsh. There are 2 large

parts of the marsh: The northern end, which is heavily influenced by tidal flows upon observation, and the southern end, which is completely secluded from human traffic and other anthropocentric factors.²³

Beneficial uses to this land include many of the same factors that have been discussed for other sites: Bird-watching, site-seeing, walking, cycling, and other recreational activities around the water are all existing beneficial uses that the public could have the potential to take advantage of. The 2 problems that exist in hindering these uses are the fact that the marsh lies on private land, and the entire site is surrounded by barbed-wire fencing to keep people out.²³ However, in at least three observations done on the area, the fence outside of Trader Joes was left



²³ ESP 400, Econ team field observation

wide open for no apparent reason.²⁴ If the barbed-wire fence were to be taken down, the public could have more trails to hike, walk, and bike around the various areas of the marsh to experience the vast amount of wildlife that is around the area.

Campgrounds



The Campgrounds site is located on 2nd Street, next to Marketplace Marsh in Long Beach in the Los Cerritos Wetland Authority Phase 1 Acquisition area south of the Bryant Property. This portion of land today sits year round being unused with the exception of a few oil derricks. Wildlife, including shorebirds and waterfowl, are not seen here very often due to the lack of water that enters the site. However, there is potential for wetlands to exist here, as vegetative evidence seen on site suggests that wetlands have subsisted here in the

past.

An elevated bike path exists on the west side of the San Gabriel River Channel. After a bit of searching, open 6-12” pipes were seen running from what is suspected to be the San Gabriel River channel underneath this bike path and emptying into the Campgrounds area. It is perceived to the observer that these pipes are used at times when the San Gabriel River is close to breaching the elevated channel way. However, with a few modifications to existing oil derricks and existing pipelines, the Campgrounds area could potentially become a thriving marsh area once again. By extending the existing pipeline to a lower elevation that would be below the water level and opening the valve, the Campgrounds site could see the same beneficial uses as other marshes in the area. But in its current state, the area will only receive water from time to time, and thus economically we can only consider the potential benefits of what could be.



Callaway Marsh



Callaway Marsh is located off of Pacific Coast Highway where the San Gabriel River flows under the highway in Long Beach. It is a relatively small, secluded, and somewhat uncharacteristic marshy area that would not be noticed unless a biologist told you a wetland existed there. It is bounded between the San Gabriel River Channel on the western side, and the peripheral Haynes Generating Plant channel on the eastern side.²⁵ A pipe emanating from the San Gabriel River running under the bike path allows tidally influenced water in and out of the marsh. The area around the marsh is utilized by fisherman on a daily

²⁴ ESP 400, Econ team field observation

²⁵ http://www.rmc.ca.gov/wetlands/pdf/_&_jpg/Los%20Cerritos%20Wetland%20Area.pdf

basis, hoping to catch their share of halibut, stingray, and bass living in the heated water coming from the Haynes Plant.

Beneficial uses observed at this site include the aforementioned fishing and recreational activities like running, walking, and cycling.²⁶ On numerous occasions, anthropocentric activity was observed atop the San Gabriel River Channel running parallel to Callaway Marsh. Once again, access is a hindrance to the potential uses of this area. Accessibility is limited to one entrance off of PCH and a small gate off the elevated bike path.



Zedler Marsh

Zedler Marsh is located North-east of Callaway Marsh in Long Beach. Professor Eric Zahn from California State University, Long Beach named it Zedler Marsh after Joy B. Zedler, wetland biologist and author. Zedler Marsh is a locked site and it is owned by the Los Cerritos Wetlands Authority, which is focused on preserving the Los Cerritos Wetlands area. A culvert allows saline water from the San Gabriel River to flow into the marsh, where it pools and creates a nice habitat for salt marsh plants, a variety of local

birds, and migratory birds.

The current beneficial uses of Zedler Marsh consists of wildlife habitat and limited educational opportunities (biology and economic research for ES&P's 400 class), because it is closed off to the public. If or when the marsh is open to the community, the beneficial uses could increase to walking, cycling, bird watching, and possibly picnicking in the area.²⁶



Tongva Pond

Tongva Pond is located off of Seal Beach Boulevard., in the new gated community of Heron Pointe in Seal Beach. On site is an educational walk complete with informational signs etched into rock outlining the history of the Tongva people that lived in this area. At the end of

²⁶ ESP 400, Econ team field observation

the trail lies a memorial circle made with artifacts that were uncovered while building the new housing community. According to the Tongva website, “As late as 1959, you could float a small boat or kayak on the wetlands all the way to the housing tract which was built on the heights.”²⁷



The area referred to is the Hellman Deed Restricted area, which runs up against the highly contested Heron Point community. Today, Tongva pond is merely a sliver of the wetlands that existed here almost 50 years ago. Next to the Tongva memorial circle is a small but secluded pond that is home to a rich variety of birds.

The first beneficial use at this site that stands out is the educational value to the community. The signs leading up to and surround the memorial circle are a valuable part of the land that educates passerbies about the value this land has. It should be noted that the signs surrounding the circle were missing at the time of our observations.²⁸ We suspect vandalism or wind damage was the reason for the absence, but the hope is the signage can be returned. In addition, bird-watching, cycling, and picnickers were all observed to exist around the Pond. Because of its seclusion, the area has the potential to become a biological preserve to protect the birds and wildlife that frequent the area.



Gum Grove Park

Gum Grove Park is located off of Avalon Dr. in Seal Beach overlooking the Hellman Deed Restricted area. The park at the end of the driveway consists of a large wooded area complete with a trail open to cyclists, runners, and dog-walkers. As recently as April 2007, construction crews started \$145,000 project to expand the park by 4 acres. The deal was struck with the Coastal Commission as a result of the Heron Pointe housing community being built to the east.²⁹

Beneficial uses to the community of this land were solely centered on anthropocentric activity based on our observations.³⁰ On numerous occasions dog walkers were observed walking through the park via the dirt trail. Two male teenagers were also spotted going into the park with paintball guns, using the park as a paintball site. In addition, walkers were frequent

²⁷ <http://www.tongva.com/lands.htm> Accessed 5/4/07

²⁸ ESP 400, Econ team field observation

²⁹ http://www.oregister.com/oregister/news/local/sealbeach/article_1663771.php

³⁰ ESP 400, Econ team field observation

around the area. On two separate days, one woman along with her kids was observed walking through the park.³¹ In addition, bike ramps were seen above the park being utilized by local children. Because no standing water exists in the area, the potential for wetlands to exist in this area is limited. However, with the construction of new acreage to the park and irrigation system, there might be potential to waterfowl and small fish to use the area as another option to Tongva Pond.



Hellman Deed Restricted Area



The Hellman Deed Restricted area is located off of Avalon Drive in Seal Beach, adjacent to Gum Grove Park. According to the California Coastal Commission, the property is around 27 acres that is known to consist of “wetlands and biological resources” including special-status plants such as the Tar plant.³² The area is overlooked and flanked by Gum Grove Park, and now sits year round being largely unused and underutilized. What little water that enters the site is largely the result of pipes that connect to the Haynes Cooling

channel adjacent to the property.³³ In 1998, this area was given a coastal permit to construct 39 acres of wetlands, an 18-hole golf course, and 13 acres of future wetlands area once oil operations ceased.³²

From our observations, the Economics team noticed many potential uses for this land, but did not observe many existing uses. Access to this site is fenced in by barbed-wire; therefore the public is forced to experience this vast expanse of land from atop Gum Grove Park and driving by on Pacific Coast Highway. Wildlife in this area was at a minimum, but if wetlands and water

³¹ ESP 400, Econ team field observation

³² <http://documents.coastal.ca.gov/reports/2007/4/W10a-4-2007.pdf>

³³ <http://www.longbeach.gov/civica/filebank/blobload.asp?BlobID=8666>

was restored to this area, there is potential for increase in numbers of wildlife. In addition, the number of people seen at Gum Grove Park adjacent to Hellman Ranch could utilize the area as a sightseeing point as they walk their dogs or run in the park overhead.

Table 2.1 Beneficial Uses

Uses	Sites											
	Co Lag	Sim's	Jack	SSS	Shop	Market	Camp	Callaway	Zedler	Tongva	Gum G	Hellma
AGR	1	0	0	0	1	0	0	0	0	1	0	0
AQUA	0	0	0	0	0	0	0	0	0	0	0	0
BIOL	2	2	2	1	1	1	1	1	1	1	1	1
COLD	0	2	0	0	0	0	1	0	0	0	0	0
COMM	2	0	0	1	0	0	0	0	0	0	0	0
EST	0	0	2	2	1	2	1	2	2	0	1	1
FRSH	0	0	0	0	0	0	0	0	0	0	1	0
GWR	1	0	0	0	0	0	1	0	0	0	1	0
IND	0	0	0	0	1	1	2	0	0	0	0	0
MAR	2	0	2	2	2	2	1	2	2	0	0	1
MIGR	2	1	1	1	1	1	1	1	1	1	1	1
MUN	0	0	0	0	0	0	0	0	0	0	0	0
NAV	0	0	0	0	0	0	0	0	0	0	0	0
POW	0	0	0	0	0	0	0	0	0	0	0	0
PROC	0	0	0	0	0	0	0	0	0	0	0	0
RARE	2	2	2	2	1	1	2	1	2	1	1	1
REC-1	2	0	0	2	0	0	0	0	0	0	0	0
REC-2	2	2	2	2	2	2	2	2	1	2	2	1
SAL	0	0	0	0	0	0	0	0	0	0	0	0
SHELL	0	0	0	1	0	0	0	1	0	0	0	0
SPWN	2	1	2	2	2	2	1	1	0	1	0	1
WARM	0	0	0	0	0	0	0	0	0	0	0	0
LWRM	0	0	0	0	1	1	1	0	0	1	1	1
WET	2	2	2	2	2	2	1	2	2	2	1	1
WILD	2	2	2	2	2	2	1	2	2	2	2	0
EDUC	2	2	2	2	2	2	2	2	2	2	2	2

Key:

0: Not Existing, 1: Potential, and 2: Existing Beneficial Uses

Sites:

- 1: Colorado Lagoon
- 2: Sim's Pond
- 3: Jack Dunster Marine Reserve
- 4: Steam Shovel Slough
- 5. Shopkeeper's Marsh
- 6. Marketplace Marsh

7. Campgrounds Site
8. Callaway Marsh
9. Zedler Marsh

10. Tongva Pond
11. Gum Grove Park
12. Hellmen Deed Restricted Property

Uses: For definitions see Appendix B.³⁴

Beneficial Uses, Table Interpretation

Based on the observations we compiled in our project, we came up with a beneficial uses data table. This data table was the result of our knowledge of the site just from surveillance and some background knowledge. While we have been given and researched much of our information, our group felt the need to consult a wetland scientist to interpret our findings of beneficial uses as being correct. To do this, we interviewed Eric Zahn, a professor at California State University Long Beach, and made various changes to our beneficial uses data table based on his input.³⁵ This was done in an effort to make our data as accurate and biologically correct as possible, from a person who has knowledge and experience studying the area.

One major change needed to our findings was within the SAL category denoting inland wetland habitats. Based on the interpretation of the definition by the Regional Water Quality Control Board categories, the Los Cerritos Wetlands would never be considered an inland habitat, so this category was changed to 0 for each site. Another change was the fact that some endangered species existed at some sites the Economics team did not know resided there. For example, Eric has seen Belding Savannah Sparrows at the Campgrounds site, and therefore the change to an existing use on this category was made. Because of this new information, some cells in the RARE category were changed. The MIGR category definition was interpreted by Eric to mean strictly the migration of fish and there are none existing in the Los Cerritos wetlands. However, if restoration of the complex took place, the possibility of migratory fish like the Killifish could exist. Consequently we changed the numbers in this category to potentially existing across the board (1). Beneficial uses in this category could also change if the definition of MIGR included marine birds. The BIOL category was also interpreted by Eric and the Economics team to be strictly what is considered biological preserves that exist today. Because Colorado Lagoon, Sims Pond, and Jack Dunster are the only ones that exist currently, the other sites were all changed to potentially existing (1). The LWRM category was also interpreted by Eric and the Economics team to be areas where freshwater pools collect from rainwater. Subsequently, various changes had to be made to the table to account for this definition. Other small changes were made to the table based on Eric's knowledge and experience with the area as well, which can be see in the data table highlighted in yellow.

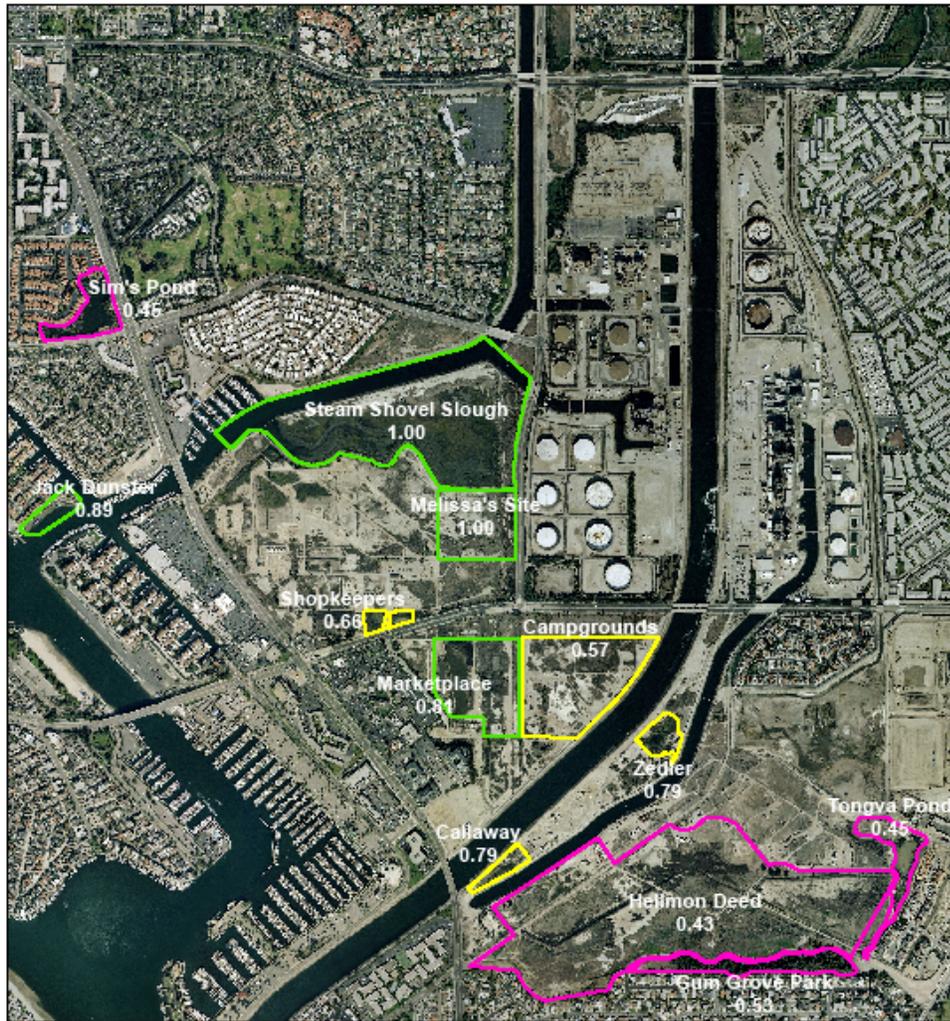
The potential category (1) may have hurt our data table because it is subjective to each observer's opinion and in actuality with extensive restoration each site could 'potentially' have all of the beneficial uses added to them. Finding the mode was not the best way to determine the actual uses at the sties because the numbers were based on existing, potential or not existing. Even if only one person saw that the use existed at a site, then that needed to be taken into consideration and discussed among the entire group after we had done our observations, to

³⁴ http://ceres.ca.gov/wetlands/geo_info/so_cal/terms_definitions.html#RWQCB

³⁵ Prior to this conversation, an Education (EDUC) category was added to our revised beneficial uses data table. This was done to account for the obvious educational uses that all of these areas currently possess or could in the future. One such example is Tongva Pond, which is home to informational placards and signs about the Tongva Indians. All sites visited in the Los Cerritos Wetlands could also be used by various classes in the CSU system, as well as junior college and high schools around the area for various activities.

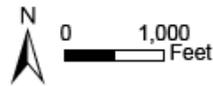
determine if we should mark it 2, and not just the most common occurring number. If three people do not see the use existing while two people do, it still needs to be 2 (existing) because it does exist. The data may also be skewed because we may not have observed with the same exact opinion of each definition of the designated uses even though we all had the definitions. Each of us could have interpreted the definition differently, causing a bias even with slight variations, so this should be taken into account the next time the sites are observed.

Los Cerritos Wetlands Beneficial Uses



Scores	
	0.43 - 0.55
	0.56 - 0.80
	0.81 - 1.00

Scores calculated as sums of 17 Use Designations, each weighted according to two factors, and normalized by the highest number. First factor determines existing (2), potential (1), or non-existing uses (0), negative and positive. Second factor is the valuation of importance (3-high to 1-low).



Danae Werthmann
May 15, 2007

Map 2.1 Los Cerritos Wetlands Beneficial Uses

GIS Map

Map 2.1 shows 11 of the 12 sites that the Economics team observed; with Steam Shovel Slough divided into the slough and Melissa's Degraded Site, in order to see the distinction of the two sites the Biology Team monitored. The one site not located on the map is Colorado Lagoon because the map needed to be reduced a great deal to see that site. The spatial question the map was based on is, "Which of the 12 sites is the one that should be restored first, as a wetlands habitat?" The answer is indicated through the various color shades, with green being the higher ranking sites and the pink the lowest ranking sites. As indicated in the paragraph within the map, the numbers were determined by weighting the Uses Designations from Table 2.1 and then normalizing the total, to show the top site being 1. Only 17 uses were included because the category values with the same value at each site could not be a criterion of selection since they were not differentiated and would only increase the scale unsubstantially. A main problem with this scoring technique is the inability to take into account public access as well as the size of each site. If certain sites were restored the larger acreage would potentially allow for more beneficial uses to exist, and this was not taken into consideration. A second criticism of this scoring method is that restoration would result in the realization of the potential uses, and the incremental benefit would be related to summing the number of potential benefits that restoration or enhancement would provide.

An alternative scoring method would be to rescore the sites relative to one, another by adding the number of potential beneficial use categories and see which site has the highest number; this would weight each potential beneficial use equal with each other, rather than allowing for some beneficial uses to have a higher benefit than other use categories. If some potential use categories are of greater benefit, then an equal weighting would be potentially biased in favor of sites with a higher number of potential beneficial use categories. This scoring method could be modified to allow for a weighting of beneficial use categories if some general agreement is possible to rank the categories.

The highest scoring site on the map is Steam Shovel Slough/Melissa's Degraded Site, which would make sense because wetlands scientists considered it a pristine salt water marsh thus it generates more beneficial uses than other sites. The second ranked site is Jack Dunster Marine Reserve and is already a marine preserve, proving that preserves should be created to restore and maintain the integrity of the site. Once the site is restored more beneficial uses will exist and provide more enjoyment to humans. Sim's Pond, also a biological preserve, had a lower value; but we feel because it is closed off to the public, the beneficial uses greatly diminished. Had size been taken into consideration, the Hellman Deed restricted area may have had a higher ranking in the scoring process as well.

After observing the Los Cerritos Wetlands it is apparent that the area is precious to the community. There are many possibilities for restoration within this ecosystem that can be beneficial to society. From the outside, the wetlands may look dilapidated and empty. However, as indicated by the table and observations, there is a vibrant community of wildlife existing within the wetlands and the sites are utilized by humans when they have access to them and are aware of them. This is important to note since the Southeast Area Development Improvement Plan (SEADIP) advisory committee, appointed by 3rd District Member Gary DeLong,³⁶ will most likely be recommending by next spring (2008) rezoning the parcels of land where the sites are located. As indicated by Angela Czuba, under the Coastal Zone Management Act, the Los Cerritos Wetlands is zoned for industrial and residential development at this time. The new

³⁶ <http://www.gazettes.com/seadip04262007.html>

baseline data determined by the economics team should help present some of the benefits of restoring and enhancing the wetlands to assist the rezoning effort.

Determining the baseline data for the Los Cerritos Wetlands had not been done before and by establishing this, one more crucial step has been completed for defining the hypothetical market for a CV survey, in its entirety. This data can be used to improve the design of the 2006 economic CV questionnaire because a clear description of the various sites are provided, reflecting more accurately the actual uses occurring in the wetlands. This should also be used as an educational tool to make more nearby residents of the Los Cerritos Wetlands aware of the many benefits offered by these wetlands, so they can start having a vested interest in preserving them. A future potential project could include surveying people within educational institutions, especially teachers to determine if they would be willing to use the Los Cerritos Wetlands as a field research lab.

Critique of 2006's ESP 400 Economic CV Survey

Critique of Methodologies, Angela Czuba

The 2006 Economics team chose as their target population the residents of Long Beach and Seal Beach over the age of 18, living close enough to the Los Cerritos Wetlands to make a day-trip, and would receive the benefits of restoring the wetlands. This was a respectable target population, but they did not include what neighborhoods, streets, or addresses they went to in order to conduct their questionnaire. Future teams could benefit from knowing the locations of where the interviews took place in case they decide to conduct interviews for their projects.

The interviews were carried out in a face-to-face manner which is the optimal way of informing the people about the Los Cerritos Wetlands. It is possible that many of the people who were interviewed were not aware of the wetlands or their importance to the ecosystem. Informing the people of the wetlands most likely allowed the questions to be answered in a more accurate manner. If the people did not know anything about the wetlands, then they would not have a basis for deciding the value of enhancing them. If the Economics team left copies of the questionnaire (in a shortened form) in people's mail boxes and then picked them up at a later time, they may have gotten a larger response and the answers would be more representative of the entire population. This method would eliminate interviewer bias. However, this method would be more expensive due to needing more copies of the questionnaire with no guarantee that the questionnaires would be filled out or filled out correctly; also, a mailed survey has well known limitations of no control over the order of information presented to the respondent, leading to another type of bias.

The time it took to complete one survey was 20 minutes, typical for an in person survey but it limited the number of people willing to complete the questionnaire. These were good lessons learned by the team. They learned that time is very important when conducting interviews, and that making the questionnaire short and concise will benefit both the interviewer and interviewee.

In order to keep interviewer bias to a minimum, the interviewer read directly from the cards and did not deviate or go into further detail. This was a good method of decreasing the bias, but the questionnaire itself was limited to answering the question of the value of enhancing the environment, and therefore cannot also answer the question of what the economic benefits are from development in the wetlands, such as building a Home Depot in the area that would bring in tax revenue. Since this questionnaire asked questions pertaining to the enhancement of

the Los Cerritos Wetlands, future Economic teams could create a questionnaire that informs the respondent about development of the wetlands. The questionnaire could include information regarding increased tax revenue (from new development) vs. preservation of the wetlands. The information could cover the positive and negative impacts new development would have on the respondent or his or her community such as increased tax revenue (benefits to schools and local police department), increased shopping convenience, increases in traffic, air pollution, increases in local population, and decreases in wildlife habitat and open space.

Sections A through H (F was improperly labeled as G) flowed in an understandable manner, but they all could have been shortened by eliminating some of the questions that were not specifically related to the economic analysis of the willingness-to-pay of the people interviewed. This initial questionnaire will be a good starting point for future Economic teams who choose to conduct an interview because they will know what kind of questions are important and which are not.

Description of the Hypothetical Market, Danae Werthmann

Wetland, the good to be valued, was defined clearly on p. 68 of the 2006 Final Report. The respondent should have been given a brief oral description of what the Los Cerritos Wetlands consisted of, while reviewing Slide B and C, so they knew what they were looking at. The baseline amount of the good may have been shown on Card B, Slide 1, page 78. However this segment is weak because it does not provide a measurement that would give the viewer an idea of how large the site was. This could have either been done by including it on the slide with street names, or by mentioning the acreage to the viewer as they looked at Card B.

In Section D, the survey discussed the two problems identified inhibiting restoration: purchasing land and needed funds. The 2006 Economics Team then asked the amount the person was willing to pay in additional taxes to purchase the land. The questionnaire tried to prevent hypothetical bias by explaining what it meant, and to think of the questions as if they were on a referendum and if they would vote yes or no, which was a strength in their questionnaire, because they took this bias into account.

The hypothetical market relies on the policy change to be valued, which in the survey appeared to be enlarging the salt march wetland ecosystem and restore it to its natural state. Within the survey this was implied in Section D.

Socioeconomic Characteristics

The students asked questions regarding the respondent's characteristics both before and after the questions on WTP, which is desirable. In the beginning, they warmed the respondent up and helped them to start thinking about the issue, with generic questions to rate the importance of familiar environmental things. Then after the questions eliciting value the interviewer focused on the socioeconomic characteristics. Reviewing the questions, under Section E: Wage, Income, Residence, and Section G: Socioeconomic Variables, it seems that it is quite comprehensive without being too overwhelming or invasive (a huge advantage in determining what population they reached). To strengthen their results section, they should have included an overview of the average person based on the 37 full surveys.

Legal/Policy & Science Issues

The only legal/policy issues raised were in Section D. It mentioned that wetlands have 'some general protection under the law by entities...' (71) and these wetlands still face

degradation because of improper enforcement and development. They do not mention the potential for proper enforcement and development and the willingness-to-pay for this by the polluters, just taxes to restore the wetlands, which could be a potential weakness. Weaknesses existed in the lack of extra material relating to other fields of significance including: biology, hydrology, environmental chemistry. The biological benefits were shown on Cards E-H, but those were only pictures of birds, even though it said the cards contained types of animals and plant organisms. There was no mention of the hydrological or environmental chemistry benefits that could be gained from restoring the wetlands. Maybe these were not included because they could not be shown with a photograph. While these may be weaknesses, the group may have decided not to include these because of the length the questionnaire and time constraints. However, people may respond differently if they knew that the wetlands could help clean up the water not just for the plant and animal organisms, but also for humans.

Questions to Elicit Value

The elicitation of willingness-to-pay was determined by using cue cards with close-ended amounts, though it does not state in their Methods section explicitly how they determined the elicit value. By opting out of using the open-ended elicitation, they cut down time for the respondent to answer because he/she did not have to come up with a number on their own. This seems to be a plus, since they had a hard time keeping anyone interested in the survey that long. However, there may be a weakness with the cue cards because it forms a starting point bias. Another weakness may have been only asking each person their willingness-to-pay in tax-form with one additional question on taxes through referendums; unless they determined no other means would be easily understood or explained to each person due to time constraints. Different portions of the wetlands may be more beneficial for preservation; therefore, containing more value than other portions of the wetlands as can be seen with the GIS map above (Karen Chen).

Comment [DCH1]: This section has errors.

Critique of Cards A-P, Nick Cormier

Cards A-P presented in the original design of the 2006 Economics team were done well, despite a few flaws that were noticed. In critiquing this section of the survey, the 2007 Economics team hopes for future ESP 400 classes that choose to perform another survey will take note of the pictures, tables, and other visual aids that need adjusting. Doing this will provide a more accurate, aesthetically pleasing, and presentable survey. Using the baseline set by this year's economics team will hopefully improve the accuracy of the questions, and the way in which they are worded to get a better response from respondents.

The first issue of note is Card A, which is a table that is supposed to rate the respondent's interest to the various programs, which are provided by tax money from LA and Orange County. While this information is valuable, from the perspective of the respondent, the first thing they should see is a photograph of the Wetlands themselves. This pinpoints the area that is being discussed as soon as the survey begins, and takes questions out of the respondent's head, such as "Why are you surveying me?" An improvement to this would be to put Card A's data table behind Cards B and C, which provide photos of the wetlands from various sites. This could also invoke some emotional interest on the part of the respondent before they were to respond to Card A, which could make them more apt to answer the questions carefully. Card A should include more photos of beneficial uses that were established in the baseline set by this year's team. It is a good idea to mention park management but there should be points that direct the respondent toward the recreational and biological uses of the wetlands themselves.

Cards B and C are great pictures that show the wetlands at various tide levels and aerially. This is important to show the respondent because most people who are asked about the wetlands do not know they exist or where they are located. Identifying the area aerially with landmarks and streets known to the respondent will make them more aware of Los Cerritos Wetlands every time they drive by it. The only criticism to these pictures would be to Cards B-Side 2, and C-Side 2. A picture similar to the one in the survey, but with more flora and fauna shown, would show the respondent the richness of wildlife and diversity that exists in the wetlands today. Card B should have a portion that allows the person being interviewed to have an answer other than the choices.

A clearer, color image of Card D showing the various wetlands in Southern California would be expected in a new survey. The image in the survey in 2006 is grainy, outdated, and unclear as to what wetlands still exist in Southern California today. A map, possibly GIS produced, labeling every wetland from San Diego to Santa Barbara in a colorized fashion, would provide the respondent more information as to where wetlands exist in Southern California. Respondents could possibly even answer the question being asked more accurately, by identifying areas that are considered wetlands that were not known to be wetlands to the respondent before the survey.

Cards E through H show the various animals that exist in the Salt Marsh ecosystem. One criticism is on Card E, presenting the Belding's Savannah Sparrow. Another image would be needed in future survey, as the picture used in the survey is pixelated and unclear. This could be difficult however, as getting good pictures of this rare bird are sometimes hard to come by. Another idea would be a GIS-produced image showing the various sites where endangered animals are known to exist in the wetlands today by using the beneficial uses table. Card H could be improved as well by showing a closer view of the birds.

Once again, Card I which depicts a Belding's Savannah Sparrow, would ideally be a clearer picture in a future survey. To add to these images, a picture of potential habitat for one of these birds with oil derricks in the background would convey the message that industry and habitat loss are a problem for these birds. This should be relatively easy to depict with the generous amount of oil derricks scattered around the Los Cerritos Wetlands complex.

More flora and fauna would be nicer to view in Card K side 1. In the survey, the surveyor states that environmental amenities are present in Bolsa Chica Wetlands, yet there is no picture of any of these in the Cards. This must be rectified to include a picture of people jogging, hiking, bicycling, or other recreational activity. Doing this will get the message across that restoring Los Cerritos Wetlands in the same manner could do wonders for the public use of the area. Now that a baseline has been set for the Los Cerritos Wetlands, adding these pictures could be easily done and convey to the respondent that people use this land in the same way as Bolsa Chica. Moreover, doing so would emphasize that the two are substitutes for recreational activity on any given day.

Card L lacks labeling of what exactly is private and public land. In addition, an outline surrounding the perimeter of the pristine salt marsh in Steam Shovel Slough is necessary to show the viewer where exactly this resides from an aerial view. The inclusion of the Los Cerritos Wetlands Land Trust brochure, however, is a great idea and should be applauded. The mention of the contact information and website subtly could provoke some respondents to become more interested in the topic.

Card M-I, II, and III are good for the nature of the survey, which only presents 1 possible restoration plan of Los Cerritos Wetlands. A picture of the current state next to the first phase of

the plan would be nice to compare, but isn't necessary. In addition to this plan of restoration, another image of another plan would be helpful to include. By altering the survey to include more than 1 restoration plan with images of all the plans, the surveyor could determine the willingness to pay for incremental amounts of restoration/enhancement. This could be done relatively easily by having two alternative questionnaires. Card N would still work perfectly in that case, and could still be used in both questionnaires to determine accurately the willingness to pay for both. Further, explaining the potential uses for each site established in the baseline beneficial uses table could enhance the respondent's opinion of the area.

Cards O and P to determine financial states seem well suited for the questions that are being asked about them.

Most of the weaknesses come back to the time constraint. If they had time or were able to make a higher-responsive survey or had the time to approach more people, could they have included all the extra things that they lacked in their survey? It seems that they struggled enough with the questions they did have to get people to take their survey, and to make it longer may be more problematic. This is one of the reasons for establishing our baseline for our hypothetical market. The more our teams refine this survey to get a more accurate and larger response in less time, the better the chances are that Los Cerritos Wetlands will be enhanced in the future.

Biases Critique, Hironao Okahana

The questionnaire or survey must be simple. The questionnaire is intended for general residents of this community; however, there are a number of technical explanations involved and may potentially discourage those individuals from responding to this survey. It needs to be easier and simpler for them to respond. Furthermore, complicated explanations or prompts for actual questions may lead respondents to answer in certain ways. While it is important to provide them with background information regarding the wetlands, it must not be excessive information, particularly with an environmentalist tinge that could mislead them into a more positive answer. In order to assess the extent the public is willing-to-accept and pay, the public should be surveyed with less technical information, since it potentially guilt trips them into their responses, losing objectivity. Who would be okay with harming those birds, after seeing multiple pictures of them? Overall, the questionnaire seems to lead respondents to support preservation efforts; hence additional information will only increase such tendency or possibly turn the survey into a lecture instead. A possible bias specific to contingent valuation was non-response bias, because in trying to make a complete survey/questionnaire it took up too much time, which deterred a high response.

Conclusion, Karen Chen

The aim of this critique was to better refine the quality of the survey and improve the efficiency of the format. This year, we took a detailed look at the survey format and methodology used by the previous class; making several suggestions that might improve the results of future studies. It is essential to correct any bias or oversight that was included in the original survey. Several weaknesses were spotted through the critique and pointed out, so that it will strengthen the results. To have a complete survey, it must be entirely neutral, without directing the results toward a biased conception. Background information provided to the surveyed needs to be well rounded and accurate. The critique also provides the survey with new updates of the situation and condition of the issue. The overall goal of the team is to assess the value of the wetlands and to determine the public's general knowledge. Factors of: time,

content, quality, format, and methods were all incorporated into the critique. All in all, the survey is a key element in gathering information from the general population. The changes that were made may induce different results from the previous year and potentially produce a more conclusive outcome. In addition, the central point of the survey was to provide a baseline that adequately represents the wetlands.

Appendixes

A. Field Recon Site Directions

- **Colorado Lagoon** - take 4th street, turn left onto Park Ave., turn right onto 6th St, and turn right into Colorado lagoon
- **Jack Dunster** - left onto 6th street, left onto Park Ave., left onto E.Appian Way. Left onto e. Colorado St., right onto E. Elliot St., right onto Boathouse lane, take to the end for Jack Dunster Reserve, park in the lot at the end of the street.
- **Steam Shovel Slough** - back out from Boathouse Ln., turn right onto E. Elliott St., turn right onto Bellflower Blvd, turn left onto Loynes Ave., park to the left on Palo Verde Ave. for steam shovel slough site (it's a long walk to the slough site this way, so I recommend going to this last by parking at the golden sails parking lot and walking to where we went on the boat for the field trip.)
- **Tongva Pond** - turn left onto Loynes Ave, turn right onto Studebaker road, turn left onto Westminster ave/2nd street, turn right onto seal beach blvd, turn right into Heron Pointe gated community (gate should be open), go to the end of the street and turn right, (there is a small walkway through some green pillars at the end of the street where there is a turnabout. I walked down this grassy path and got a decent view of Tongva pond. I walked through the bushes too to get right next to the water if you feel like it.)
- **Gum Grove Park** - turn right onto Seal Beach blvd, turn right onto PCH, turn right onto 5th St, turn left onto Coastline Dr, and turn left onto Avalon drive for Gum Grove Park.
- **Callaway Marsh** - Go back out towards PCH; turn right onto PCH, park at small dirt patch before bridge crossing San Gabriel River to visit Callaway marsh.
- **Marketplace, Shopkeeper's, Campground sites** - turn right onto PCH, turn right toward united artists theaters, go around the back to meet up with shopkeepers road and turn left, park on street near Trader Joes to visit Shopkeeper's marsh, Marketplace Marsh, and Campground site. **Shopkeeper's marsh can be seen by walking across 2nd street towards the Bixby ranch company building.**

B. Definitions³⁷

Beneficial Use Categories

State and federal laws approach the concept of Beneficial Uses from slightly different angles. In practice, Beneficial Uses are thought of as uses of water necessary for the survival or well-being of man, plants and wildlife. Because the specific uses that would qualify under that broad definition are almost innumerable, the State and Regional Water Quality Control Boards (Water Boards) define Categories of Beneficial Uses. Periodically the Water Boards designate the Categories of Beneficial Uses currently or potentially being supported by waters in their region. Keeping water quality at levels/conditions that will continue to support those uses is the basis for a whole program of water quality protection implemented by the Water Boards. The twenty-five Beneficial Use Categories defined for waters of the state are provided below in alphabetical order:

AGR: Agricultural Supply. Includes uses of water for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, or support of vegetation for range grazing.

AQUA: Aquaculture. Includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

BIOL: Preservation of Biological Habitats of Special Significance. Includes uses of waters that support designated areas or habitats, including, but not limited to, established refuges, parks, sanctuaries, ecological reserves or preserves, and Areas of Special Biological Significance (ASBS), where the preservation and enhancement of natural resources requires special protection.

COLD: Cold Freshwater Habitat. Includes uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

COMM: Commercial and Sport Fishing. Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to uses involving organisms intended for human consumption or bait purposes.

EST: Estuarine Habitat. Includes uses of water that support estuarine ecosystems. These uses include, but are not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

³⁷ http://ceres.ca.gov/wetlands/geo_info/so_cal/terms_definitions.html#RWQCB

FRSH: Freshwater Replenishment. Includes uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

GWR: Groundwater Recharge. Includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

IND: Industrial Service Supply. Includes uses of water for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.

MAR: Marine Habitat. Includes uses of water that support marine ecosystems. These uses include, but are not limited to, preservation or enhancement of marine habitats, vegetation, such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

MIGR: Migration of Aquatic Organisms. Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

MUN: Municipal and Domestic Supply. Includes uses of water for community, military, or individual water supply systems. These uses may include, but are not limited to, drinking water supply.

NAV: Navigation. Includes uses of water for shipping, travel, or other transportation by private military, or commercial vessels.

POW: Hydropower Generation. Includes uses of water for hydropower generation.

PROC: Industrial Process Supply. Includes uses of water for industrial activities that depend primarily on water quality. These uses may include, but are not limited to, process water supply and all uses of water related to product manufacture or food preparation.

RARE: Rare, Threatened or Endangered Species. Includes uses of waters that support habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law as rare, threatened or endangered. This designation is based, in large part, on the information contained within RareFind. RareFind is an application of the California Department of Fish and Game's Natural Diversity Data Base (NDDDB).

REC-1: Contact Water Recreation. Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, whitewater activities, fishing, or use of natural hot springs.

REC-2: Non-contact Water Recreation. Includes uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

SAL: Inland Saline Water Habitat. Includes uses of water that support inland saline water ecosystems. These uses include, but are not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

SHELL: Shellfish Harvesting. Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

SPWN: Spawning, Reproduction, and Development. Includes uses of waters that support high quality aquatic habitats necessary for reproduction and early development of fish and wildlife.

WARM: Warm Freshwater Habitat. Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

LWRM: Limited Warm Freshwater Habitat. Includes uses of water that support warm water ecosystems which are severely limited in diversity and abundance as the result of concrete-lined watercourses and low, shallow dry weather flows which result in extreme temperature, pH, and/or dissolved oxygen conditions. Naturally reproducing finfish populations are not expected to occur in LWRM waters.

WET: Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

WILD: Wildlife Habitat. Includes uses of water that support terrestrial ecosystems. These uses include, but are not limited to, preservation or enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

C. Economic Observations Notes

Day: Saturday

Time: 9:30AM – 1:05PM

Date: 4/21/2007

Observer: Nick Cormier

Other Points to Note: N/A

Stop 1: Colorado Lagoon

- Arrived at 9:30AM
 - Experienced problems with digital camera
 - Sited 2 dog walkers (2 middle aged women) and 1 sunbather on lawn near Northeastern outlet pipe near 6th St.
- Left at 9:50AM to buy disposable camera

Stop 2: Jack Dunster Marine Reserve

- Arrived at 10:05AM
 - Spotted clamshells and other shellfish shells all over lookout points going over the water
 - Extremely-Low Tide
 - Egret spotted on dock separating channel and reserve
 - 2-3 Male Teenagers were cleaning up the vegetation around the reserve
- Left at 10:20AM

Stop 3: Steam Shovel Slough

- Arrived at 10:30AM
 - Spotted a small coyote while walking up to the lookout site
 - After walking for several minutes, I decided to access the Steam Shovel Site from another direction by walking over the Pacific Coast Highway Bridge and walking down along the Alamitos Bay Channel (See Stop 10 below)
 - Lots of trash was spotted near Studebaker Rd. and the inlets for the Power plants (most likely due to rain runoff from the previous day)
- Left at 10:35AM

Stop 4: Tongva Pond

- Arrived at 11:00AM
 - Spotted Great Blue Heron flying overhead on Seal Beach Blvd. en route to Pond
 - Many birds at site, all chirping.
 - Most active and diverse site viewed yet. Lots of bird species spotted.
- Left at 11:10AM

Stop 5: Gum Grove Park

- Arrived at 11:35AM
 - Not a lot of wildlife spotted
 - 2 teenage males were spotted with paintball guns and attire heading up the Park towards wooded area.
 - Skateboard/BMX ramps and dirt track observed on hill above Park
 - Mother with stroller and 2 children spotted walking up the paved road out of Park
 - I asked a few questions to her, and noted that she likes to walk her dogs here, in addition to going for walks with her kids.
- Left at 11:45AM

Stop 6: Callaway Marsh

- Arrived at 11:50AM
 - 5-10 Fishermen spotted fishing off the bridge of outlet channel adjacent to SG River.
 - Middle Aged males
 - I spoke with one fisherman, and noted they catch a lot of halibut, stingray, and bass at this particular area.
 - Lots of squirrels and birds, along with a few pictures of another (or same?) Great Blue Heron moving all around the area.
 - Bikers of all ages were riding up along the San Gabriel River bank.
- Left at Noon

Stop 7: Marketplace Marsh

- Arrived at 12:05PM
 - Many Birds present
 - Pristine wetlands site in corner of Marsh (see pictures)

- To access, I went down the dirt road between the Bryant and Bixby property that starts near Trader Joe's.
- Coyote tracks were spotted all around the area.
- Left at 12:20PM
- Stop 8: Campgrounds
 - Arrived at 12:20PM
 - Spotted anthropocentric activity near fence (Homeless dwelling)
 - No wildlife was spotted from a distance other than a few small birds)
 - Could not get significant access to site today, but will try to get some at the next observation
 - Left at 12:30PM
- Stop 9: Shopkeeper's Marsh
 - Arrived at 12:35PM
 - Many numbers and difference species of birds present despite lots of vehicular traffic on adjacent 2nd St and very small pockets of water.
 - Great Blue Heron spotted. (Looked very similar to the one spotted at Callaway Marsh and near Tongva Pond earlier in the day, could be the same bird)
 - Left at 12:45PM
- Stop 10: Steam Shovel Slough (Cont.)
 - Arrived at 12:55PM
 - Noticed small birds around vegetated area
 - Spotted a lot of large fish jumping out of the water (see picture)
 - Activity was at a minimum at this site today.
 - Left at 1:05PM

Day: Sunday

Time: 4:15PM – 7:00PM

Date: 4/22/2007

Observer: Nick Cormier

Other Points to Note: Today was Earth Day, 4/22/07. This could skew the observations of what was sited on a typical Sunday late afternoon.

Stop 1: Colorado Lagoon

- Arrived at 4:25PM
 - Overcast Conditions
 - Shooting pictures with Disposable camera once again.
 - Middle Aged woman was spotted feeding birds at center of Lagoon near Parking lot
 - Man (age 30-40) fishing off bridge of lagoon
 - 2 middle aged men near Southeastern end of Lagoon (possibly fishing, but could not be sure from a distance)
 - Many seagulls present
- Left at 4:35PM

Stop 2: Jack Dunster Marine Reserve

- Arrived at 4:45PM
 - High tide
 - Saw 4-6 cormorants drying wings on dock separating channel.
 - Noticed a few small birds, including one that looked similar to a Belding Savannah Sparrow
 - Upon closer analysis, it was determined not to be a Belding
 - No People present today
- Left at 4:55PM

****Decided to stop at each site for only around 5-10 minutes due to Overcast/dark/rainy conditions at this point****

Stop 3: Tongva Pond

- Arrived at 5:10PM
 - Upon walking up to site, I noticed the information signs around the circular memorial site were either missing or had been ripped down
 - Red Tape was seen on both sides of the sign

- Lots of birds again
 - Lots of lizards
 - Took a picture of 2 kids male and female bike riding towards wetlands
 - Left at 3:45PM
- Stop 2: Gum Grove Park
- Arrived at 3:50PM
 - Lots of Dog walkers present
 - 2 middle aged males, 1 female, with a total of 5 dogs between the two
 - Butterflies but not many birds present
 - Middle aged woman out for a walk going up the hill out of park
 - Saw same woman on first day with children who I interviewed on her way to the park leaving the parking lot
 - Left at 4:00PM
- Stop 3: Callaway Marsh
- Arrived at 4:05PM
 - 5 cars were parked at parking site off PCH
 - 2 fisherman on channel bridge
 - Lots of squirrels today
 - Flock of pigeons where Blue Heron was spotted on first day of observations by Nick Cormier
 - Bikers on SG Channel again
 - Left at 4:15PM
- Stop 4: Shopkeeper's Marsh
- Arrived at 4:20PM
 - Lots of Birds again (Egret, ducks, others)
 - Rabbits in east side
 - Bike rider on street above (2nd street)
 - Went to far east corner of Marsh, but not much activity otherwise
 - Left at 4:30PM
- Stop 5: Campgrounds
- Arrived at 4:40PM
 - Lots of rodent activity
 - Noticed pipes, gate valves, and passageways where water could flow through SG channel given the chance.
 - Lots of potential for future wetlands
 - Rabbit noticed under bridge at south end of site
 - Human activity near bridge/overpass at SG channel
 - Left at 4:55PM
- Stop 6: Marketplace Marsh
- Arrived at 5:10PM
 - Most birds seen so far here
 - Possibly same Great blue heron spotted today as observation days before
 - Lots of rabbits
 - Lots of birds present as well
 - Very low tide
 - Left at 5:25PM
- Stop 7: Steam Shovel Slough
- Arrived at 5:35PM
 - Cormorant sighting on boom walking up
 - Very few birds today
 - Seal/Sea Lion sighting under PCH bridge (couldn't decipher which it was)
 - Very high tide
 - Left at 5:50PM
- Stop 8: Jack Dunster Marine Reserve
- Arrived at 5:55PM
 - 4 seagulls on channel way

- One 20-30 yr old male cleaning and doing yard work in Reserve
 - Many high school rowers outside of reserve practicing
 - Left at 6:05PM
- Stop 9: Colorado Lagoon
- Arrived at 6:10PM
 - Seven 20-30 yr old males fishing on southeast end
 - 1 middle aged woman reading near fisherman
 - Couple spotted running by fisherman soon after
 - Center of lagoon at beach
 - 2 Hispanic families spotted by water's edge
 - 4 ducks sitting right by the road
 - Dog walker going across the lagoon via the bridge
 - Overall Lots of human recreational activity happening at this site
 - Lots of birds as well (close to where the fisherman were)
 - Left at 6:20PM

Day: Thursday

Time: 8:00am-2:30pm

Date: 4/26/2007

Observer: Karen Chen

Other Points to Note: Nick also observed this date but at a later time

Jack Dunster Marine Reserve

1st trip: The day was pretty early but there were already fishermen in the Marina working on their boats. There was a man driving his boat down the channel. There were no other people nearby.

2nd trip: More fishermen activity

Tongva Pond

1st trip: No hikers spotted, Native American education signs were torn. Only observed workers doing yard work.

2nd trip: Spotted some residents within the gated community. Still no signs of hikers or walkers in the native mitigation trail.

Gum Grove Park

1st trip: dog walker, and runners

2nd trip: Several walkers, two women running

Callaway Marsh

1st trip: One fisherman, traffic was light

2nd trip: There are now more fisherman, and more car traffic, biker spotted on the channel

Colorado Lagoon

1st trip: several fishermen, hoping to make early catch

2nd trip: Dog walkers walking along the lagoon, several mothers with young children

Steam Shovel Slough

1st trip: Spotted several birds species

2nd trip: more birds

Shopkeeper's Marsh

1st trip: spotted numerous birds

2nd trip: still lots of bird activity, most human traffic were in cars

Campgrounds

1st trip: pretty much empty

2nd trip: observed several animals

Marketplace Marsh

1st trip: Like Shopkeeper's lots of birds activity

2nd trip: still many bird activities, considered the prospect of future bird education site of nature walk development.

Day: Tuesday

Time: 8:40AM – 12:40PM, 4:40PM-5:25PM

Date: 4/24/2007

Observer: Angela Czuba

1. **Colorado Lagoon:** 8:40am-9:13am. I observed people walking, a man fishing for small fish (fish bate), children playing in the nearby playground, different bird species, I saw the Colorado Lagoon Educational Center (the building that is beautifully painted), and I saw the model boat shop. I spoke to Chuck the maintenance man. He said the sea water flows from Marine Stadium, under the streets, through the Colorado Lagoon gates and into the lagoon. He thinks the sand was brought in many years ago for recreational purposes. People swim in the lagoon and it has a nick name of "Polio Pond" because the water is dirty.
2. **Jack Dunster:** 9:18am-9:33am. I saw the sign posted at Jack Dunster that says no swimming, no fishing, no taking of marine organisms, etc. I saw people at the next door rowing club getting ready to go rowing, various birds species, lots of native plant species, a floating dock (with birds resting on it), and two observation decks out looking the water. The area is small and the floating breakwater protects the shore from the erosion of the waves. I saw a few people walking along the meandering gravel pathway. I know there are educational activities associated with Jack Dunster because I came here once to plat native plant species and to take out weeds.
3. **Steam Shovel Slough:** 9:50am-10:10am. The Los Cerritos Channel is located next to the slough and the marine water flows from the channel into the slough. It is tidally influenced. The tide was low. There is a variety of birds and salt marsh plants. The area around the slough is degraded and fenced in because it is private property. In March or April of this year, I went kayaking with about a dozen other people through the slough. It was a great learning experience, not to mention good exercise.
4. **Tong-va Pond:** 10:45am-11am. The pond is located next to the new Heron Point housing community. There is a meandering gravel pathway with ten educational signs on the ground that is shaped like rocks and they give little descriptions of the history of the site. Halfway down the pathway, there is a large circle with large signs that used to describe the life of the Tong-van people, but some kids must have vandalized the site because the signs were torn down. At the end of the pathway is the pond. It has many fresh water plants and lots of birds. The pond gets its water from urban runoff. Next to the pond, behind a fence is a working oil derrick.
5. **Hellman Deed Restricted Area:** 11:10am-11:15am. The site is extremely degraded. There isn't much to observe here. I saw plants and some birds down below. If the area is purchased by an environmental organization, then the site could turn into nice wildlife habitat.
6. **Gum Grove Park:** 11:15am- 11:30am. The park is lined by eucalyptus trees. It is located between the Tong-va Pond and Hellman sites. There are people walking and a man walking his dog. The trees provide great shade for the park. Kids can bike ride around the park and along the gravel walkway.
7. **Callaway Marsh:** 11:35am-11:50am. To the right of the marsh is a channel and to the left is the San Gabriel River. The area is small. There is a culvert that allows river water to flow into the marsh. I don't saw any standing water in the marsh. There are lots of salt marsh plants. There were people fishing in the channel and I saw a bike rider riding along the river channel. I saw some run-down buildings in the back ground along with an oil derrick. I saw trash hanging around the plants; it rained a few days prior to my visit.
8. **Marketplace Marsh:** 11:55am-12:10pm. The marsh is located across the Marketplace Shopping Center. I saw some oil derricks, lots of plants, trees, and telephone poles in the area. I saw some birds flying over head, one looked like some kind of hawk.
9. **Campgrounds:** 12:10pm-12:20pm. The site is fenced in and closed off to the public. There are lots of plants and some trees. I saw a bike rider and a jogger along the San Gabriel River channel. I didn't see any homeless people.
10. **Shopkeeper's Pond:** 12:30pm-12:40pm. The pond is fenced in and the Bixby building is in the background. There were birds hanging out in the plants, some in the water, and some ducks resting on old rusty pipes near the pond. There are many wetland plants.
11. **Sims' Pond:** 4:40pm-4:50pm. Eric Zahn came with me to the pond because I needed him to unlock the gate for me. The pond is located at the Del Lago housing community. Eric said that the homeowners association used to own the pond, but they did a poor job, and they eventually gave it to the city of Long Beach. It was originally salt marsh habitat, but the development of the area (roads and homes) blocked the sea water from entering the salt marsh. The pond now gets its water from urban runoff and from the neighboring golf course. There are lots of native and non-native plant species. There is a variety of birds that inhabit the pond. This is a stopping site for migratory birds.
12. **Zedler Marsh:** 5:05pm-5:25pm. Eric accompanied me to this site also because it is closed off to the public. The Los Cerritos Wetlands Authority owns this property. There is standing water in the marsh because water from the San Gabriel River flows into it through a culvert. There were many birds wading in the marsh, foraging for food. There was trash along the edges of the marsh because it had rained a few days prior to my visit. This was a great site to watch birds.

Day: Saturday
Time: 1:00PM – 5:50PM
Date: 4/28/2007
Observer: Angela Czuba

1. **Colorado Lagoon:** 1:00pm-2:15pm. I observed people walking, a man fishing, children playing in the nearby playground, people picnicking on the tables, and a variety birds. I spoke with Taylor Park who volunteers at the lagoon, and who is also a literature student at Cal State Long Beach. We talked a long time about the lagoon and its history. He let me go inside the Colorado Lagoon Educational Center, where he showed me maps of the lagoon. He gave me two hand outs; one about commonly found plants and algae, and the other one about commonly found aquatic life at the lagoon. He opened up the education center and put out some posters that tell a little bit of the history of the lagoon. Taylor was a great resource of information.
2. **Jack Dunster:** 2:20pm-2:30pm. I saw a lot of people, young and old at the rowing club next door, getting ready to go rowing. I saw various birds species; I saw a Cormorant (bird) drying its feathers in the wind while standing on the dock. I didn't see any people walking along the path this time.
3. **Steam Shovel Slough:** 2:50pm-3:20pm. I saw a variety of birds and salt marsh plants. The tide was low.
4. **Tong-va Pond:** 3:55pm-4:10pm. There were birds in the pond. I didn't see any one else around.
5. **Hellman Deed Restricted Area:** 3:45pm-3:50pm. I saw some birds flying over head.
6. **Gum Grove Park:** 4:20pm-4:40pm. I saw about 6 to 8 young teenagers running around and hiding while they were paint balling. I saw a man walking his dog on the hillside under the trees. I saw a few couples walking through the park.
7. **Callaway Marsh:** 4:45pm-4:50pm. I saw a few people fishing off the channel and I saw a bike rider riding along the river channel.
8. **Marketplace Marsh:** 5:10pm-5:20pm. I drove right to the marsh, last time I walked in. Driving saved me time and I didn't have to worry about getting my car towed from the Marketplace shopping center parking lot (the signs at the lot say that the parking is for customers only and that cars will be towed at violator's expense).
9. **Campgrounds:** 5:20pm-5:25pm. I saw a hawk flying over head and I didn't see any homeless people.
10. **Shopkeeper's Pond:** 5:35pm-5:50pm. There were birds enjoying the wetland habitat of the pond.

D. List of bird species observed by the 2006 biology team³⁸

American Avocet	Eared Grebe	Peregrine Falcon
American Crow	European Starling	Pied-billed Grebe
American Kestrel	Forster's Tern	Red-shouldered Hawk
Anna's Hummingbird	Great Blue Heron	Red-tailed Hawk
Barn Swallow	Great Egret	Ring-billed Gull
Belding's Savannah Sparrow	Green Heron	Sandpiper
Black Phoebe	Gull	Savannah Sparrow
Black-crowned Night-Heron	Killdeer	Semipalmated Plover
California Towhee	Least Tern	Snowy Egret
Caspian Tern	Long-billed Curlew	Western Kingbird
Cliff Swallow	Long-billed Dowitcher	Western Sandpiper
Common Goldeneye	Mallard	Whimbrel
Cormorant	Marbled Godwit	Willet
Double-crested Cormorant	Mourning Dove	Yellowlegs
Dowitcher	Osprey	

³⁸ Environmental Science & Policy 400 Final Report 2006