

CHAPTER 3

Economics

INTRODUCTION

The Los Cerritos Wetlands is the largest salt marsh and only restorable estuary in Los Angeles County, with 776 acres remaining available for restoration, nearly half in Long Beach. The most valuable of all wetlands are those at estuaries (river mouths). They link together diverse and interdependent ecosystems between fresh and salt waters, between watershed and ocean, between river and marine habitats, supporting species that can survive nowhere else. Long Beach has lost a staggering 98.3% of its wetlands, compared to 70% nationally and 95% in California.

Some ecosystems, such as forests, are relatively easy to revive even when they have been severely damaged. Others, such as coral reefs and coastal wetlands, are much more difficult to bring back to life. Once lost, they are likely to be lost forever. The Los Cerritos Wetlands are unique among Southern California coastal estuaries because, despite the dredging and filling, paving and oil extraction, pollution and neglect, the biological core of the wetlands is nearly intact. There is still promise for the future.

Wetlands provide value to the human race in many aspects. These include the increase of surrounding property values, fostering tourism and greatly enhancing the health of near shore fisheries, particularly for recreational use. Healthy wetlands are also active bio-filters protecting water quality, scrubbing out toxic contaminants from transported sediments, removing suspended and dissolved solids, and trapping out floating refuse or debris before it reaches our harbor, beaches and ocean. If the Wetlands were restored our coastal waters would become visibly cleaner, wildlife would thrive, migrating birds would fill the air and our diverse estuaries would be reconnected with the Southern California ecosystem, enhancing the entire region's natural prosperity. Reviving the Los Cerritos Wetlands would provide greater long-term economic value than any other potential use.

A study appearing in *Nature Magazine* (May, 1997) found that the annual value of ecosystem services is 1.8 times the world's gross domestic product and that estuaries are the most valuable type of coastal ecosystem. On average, a single hectare (2.47 acres) of wetlands produces goods and services worth up to \$20,000 annually.

In order to determine the amount people would be willing to pay to see the Los Cerritos Wetlands restored, the Economics and Policy Team of Environmental Science and Policy 400 conducted a stated preference study.

METHODS

The key element in a stated preference study is a properly designed questionnaire (Appendix A: Questionnaire; and Appendix B: Interviewer Sheet). A questionnaire is a survey instrument that sets out a number of questions to elicit the monetary value of a change in a non-market good. Determining the economic value of a non-market good requires many components. The first is to determine the target population. Those people included in the survey are those who would receive the benefits of restoration of the Los Cerritos Wetlands. We determined this population to be residents of Long Beach and Seal Beach, over the age of 18 who live close enough to the Los Cerritos Wetlands to make a day-trip. The survey mode selected was face-to-face, as our questionnaire involved the use of visual aides (Appendix C: CARDS). This mode also permitted us to design a complex questionnaire. There was some concern for interviewer bias, but this was kept to a minimum as we read directly from the cards every time and did not deviate or go into further detail. Unfortunately this mode was relatively expensive with regard to time. It also caused our sample to not be as representative as we had hoped because we did not get to choose who we got to interview. Rather, we had to take what we could get. The next step required for a well designed questionnaire includes deciding which types of people to interview and how many of them in order to select a subset of the target population such that the results of the survey can accurately be extrapolated to the entire population. It is important to have a large enough sample to produce a precise estimate of the mean willingness to pay. Unfortunately it was not possible for us to gather as many surveys from the types of people we had planned. We originally hoped to gather a total of 84 surveys (21 each) and interview every third person that met our criteria. Time did not permit this. The length of time it took to complete each survey (approximately 20 minutes) was a great deterrent in finding people willing to participate. It was also quite difficult at times to even find a participant. Therefore the length of time it took to complete one survey was approximately one hour. We did not have the privilege of interviewing every third person. We ended up completing 46 surveys, as one of our group members was physically unable to participate.

Section A of our questionnaire described programs for which tax money is spent. The purpose of this section was to get respondents to think about substitutes and other ways in which their tax dollars are spent. It also described what a Wetland/Salt Marsh ecosystem is.

Section B determines whether the respondent has visited the Los Cerritos Wetlands.

Section C describes other Wetlands in the area, reminding the respondent that there are substitutes to the restoration of Los Cerritos, and describes the many organisms that are found in the Salt Marsh habitat in order to familiarize the respondent. Here, we also stated several endangered bird species that live in the Salt Marsh habitat. The purpose of this was to get the respondent to think about the value of the Wetlands.

Section D elicits the maximum amount the respondent is willing to pay for restoration of

the Los Cerritos Wetlands. It includes information about the Bolsa Chica Wetlands and one alternative restoration project, with three phases that is proposed there. We remind the respondent that other restoration projects in Southern California are feasible. In order to encourage respondents to think seriously about our topic of interest, and to identify and state their monetary valuation, we accounted for hypothetical bias in this section.

When we first designed our questionnaire we hoped to show each respondent a different phase of completed restoration of the Los Cerritos Wetlands to see if there was a difference between each phase and the amount willing to pay. Once we realized this would be too time-consuming and not feasible, we decided to ask each respondent how much they would be willing to pay to see the wetlands restored at each phase. We first showed them the card with varying amounts and then asked them to look at the card with phase I completed (CARD M:I) and how much they would be willing to pay. They were then asked to flip to cards depicting phases II and III (CARDS M:I,II and M:I,II,III) and respond with an amount.

Sections E, F and H included questions on the socio-economic and demographic characteristics of the respondents which were used to ascertain how representative the survey sample is relative to the population of interest and to study how the willingness to pay varies according to respondents' characteristics.

After interviewing 46 respondents, we entered the data into excel (Appendix D – not attached, see separate Excel Spreadsheet). We hoped to enter the data twice; by two different people in order to double check our entry by subtracting one data set from another, but time restraints prohibited this.

Once the data were entered, regression tests were run to determine the approximate amount adult citizens living in the Long Beach and Seal Beach areas are willing to pay (WTP) in additional taxes for restoration work (Phases I, II, III) on the Los Cerritos Wetlands. We hypothesize that the respondent's willingness to pay - W - higher taxes for restoration of the Los Cerritos Wetlands depends upon household income - M , whether the respondent is a member of an environmental organization - $E = 0$ yes, $E = 1$ no, age - A , and gender - $G = 0$ male, $G = 1$ female:

$$W = a + b_M M + b_E E + b_A A + b_G G$$

We also hypothesize that the estimated willingness to pay increases with the number of acres restored, from phase I to phase III.

Based on the averages of the exogenous variables (level of education, environmental affiliation, age and gender) applied to the above mathematical formula, we were able to estimate the average willingness to pay for the population from which the sample was taken. The estimated annual averages for restoration work that local taxpayers are willing to pay for restoration phases 1, 2, and 3, ranged between \$12,341,196.82 for phase I to

\$16,345,113.46 for phase III.

There were several things that we would have liked to do differently, that would have given us better, more accurate results. If we had more time and interviewers to get more surveys completed, our results would have been more accurate. The surveys were also too long for most participants. There were several areas that could have been condensed or completely removed from the questionnaire. We should have taken out the section asking about activities that they have participated in at the Los Cerritos Wetlands in the past 12 months as this information was not used in our analyses. We also did not run any regression tests on questions three and four, but they could have been useful if we had more time and man power to do so. Also, because respondents can only provide meaningful valuations if they believe that the scenario described is feasible, we should have incorporated the Los Cerritos Land Trust and the Joint Powers Authority between the Lower San Gabriel Rivers and Mountains Conservancy, Coastal Conservancy, Cities of Long Beach and Seal Beach) into our questionnaire to let them know there is an organization out there committed to restoring the Los Cerritos Wetlands.

Results

An economic regression analysis was conducted on a sample of the local adult population residing around the Los Cerritos Wetlands. This survey was enacted in order to find the average amount an adult person is WTP in additional taxes per year for Phase 1, 2, and 3 of the restoration plans. Our research showed this amount to be between \$32.44 and \$44.66 based on the 37 out of 46 surveys we tabulated in to our Excel worksheet. Nine surveys were discarded due to lack of information given to the surveyor by the interviewer.

The exogenous variables we took into consideration for regressions were the level of education, environmental organization affiliation (or lack thereof), age, and gender of each respondent to the interview. The y-intercept was the 37 respondents' answers to the WTP per restoration Phase.

Our research was able to come to these economic conclusions:

- The change from the average amount a person is WTP in additional taxes per year for Phase 1 to Phase 3 is \$12.22.
- 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 $Y = B_0 + B_1 * X + B_2 * Z$) for Phases 1, 2, and 3 is between \$14,089,490.40 and \$16,345,113.76.

**Introduction cited from Los Cerritos Wetlands Land Trust website at www.LCWlandtrust.org

Appendix A - Questionnaire: Los Cerritos Wetlands

Interviewer _____	Location _____
Date _____	Start Time _____

Good Morning/Afternoon, My name is _____ and I am a student in the Department of Environmental Science and Policy at California State University, Long Beach. We are conducting a research project and I was wondering if you would answer some questions. If yes....

For our current research project, we are interviewing people about the Los Cerritos Wetlands. All of your answers will be confidential and will be used purely for analysis.

Are you 18 years or older? ____ Yes ____ No Do you live in California? ____ Yes ____ No
 Are the Los Cerritos Wetlands close enough to your home for a day trip? ____ Yes ____ No
 Proceed if respondent is 18 or over and lives in Long Beach/Seal Beach. Record the number of those who do not meet specified criteria.

Hand cards to respondent. "Please do not flip through the pages until I ask you to, but follow along with the interview as I share information relevant to each part of the interview."

Section A: Description and attributes of Los Cerritos Wetlands.

These are just a few of the programs for which cities, LA and Orange County, the State of California, and Federal Government spend tax money:

Maintain Beach Cleanliness; Maintain/Improve Marine Wildlife Habitat;
 Maintain/Improve Water Quality; Marine Safety; Wildlife Protection; Coastal Development;

Q1. Please flip to card A. For each item on Card A, is this issue not important at all to you personally, not too important, somewhat important, very important or extremely important?

	1. Not Important at all	2. Not too important	3.Somewhat Important	4. Very Important	5.Extremely Important
a. Maintain Beach Cleanliness					
b.Maintain/Improve Marine Wildlife Habitat					
c. Maintain/Improve Water Quality					
d. Marine Safety					

e. Wildlife Protection					
f. Coastal Development					

Proposals are sometimes made for new projects, but additional projects have additional costs that require funding.

The view of citizens like yourself is important in the decision making process.

So, one way we can gain some insight into the public's view is to give people like yourself, information about a particular project, so that you can give your own opinion about it.

In an interview like this, some people may think that the project is unnecessary, and others may find it very valuable. We would like to know your opinion.

I want to describe to you what a wetland or salt marsh is. Generally, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. There are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year. Wetlands may support both aquatic and terrestrial species. Coastal Wetlands are closely linked to estuaries, where sea water mixes with fresh water to form an environment of varying salinities.

Now please look at Cards B and C.

Card B and C- Side 1: This is a picture taken at the Los Cerritos Wetlands. It is representative of other salt marsh wetland ecosystems in Southern California. Side 2: These are more pictures of the Los Cerritos Wetlands ecosystem.

I am going to ask you about three separate project proposals that intend to preserve and or restore the Los Cerritos Wetlands.

Section B: Recreation, Participation and Intensity

Q2. In what recreational activities have you participated at Los Cerritos Wetlands during the past 12 months such as?

- Fishing
- Hiking
- Bird Watching
- Kayaking
- Boating
- Rowing
- Scenic Tours
- Bicycling or Jogging along San Gabriel River

- Recreational Photography

Q3. Please flip to card D. About how many trips did you take to any Southern California Wetlands in the past 12 months?

If trips were taken, to which Wetlands?

Q4. About how many trips did you take to the Los Cerritos Wetlands in the past 12 months?

Section C: Contingent Valuation-Stress and Shock to Ecosystem

Along the coastline from Long Beach to the northern end of Huntington Beach, there are several different wetlands/salt marsh ecosystems which include:

- Los Cerritos Wetlands
- Bolsa Chica Wetlands
- Jack Dunster Marine Preserve
- Ballona Wetlands

We want to learn more about the value the citizens of Long Beach and Seal Beach place on the Los Cerritos Wetlands ecosystem.

Southern California's coastal zone has been heavily developed over the last century. Much of the natural wetland ecosystems have been dramatically altered due to things such as coastal development, oil drilling and pumping, river damming, river channelizing, etc.

Now please flip thru Cards E thru H.

These cards show some types of animal and plant organisms that make their home in the salt marsh wetland ecosystem.

Q5: Are you familiar with any of the organisms in the salt marsh wetland ecosystem?
 ___ Yes ___ No ___ Not Sure

According to biologists there are several endangered or threatened species that either live or breed in the salt marsh wetland ecosystem.

Please flip to cards I and J. Let me describe four of these bird species for which the Wetlands are their habit:

- Belding Savannah Sparrow
- California Least Tern
- Western Snowy Plover
- Light Footed Clapper Rail

Research shows that many of those animals that make this ecosystem their home, such as those shown on the card, are facing habitat loss due to development and oil drilling.

Just as a reminder, I would like to remind you that our primary concern is salt marsh wetland habitat preservation and restoration.

Section D: Policy, Options, Payment Mechanisms, Willingness to Pay

Q6: Do you feel that the habitat I have described has a value to today's society or future generations and is worth protecting?

☐ Yes ☐ No ☐ Not Sure

I previously mentioned several other wetland ecosystems in the general vicinity. These ecosystems have been designated as wetlands and therefore are allowed some general protection under the law by entities such as the California Coastal Commission, Cities of Long Beach, Seal Beach, and Huntington Beach, Fish and Wildlife Service, and Cal EPA. Often times though, the wetland ecosystems still face degradation and habitat loss due to improper enforcement and development.

Now please look at Card K.

Some areas have demonstrated the feasibility of restoration projects along with proper enforcement to achieve a healthy salt marsh wetland ecosystem. One example of this is in the northern portion of Huntington Beach at the Bolsa Chica Wetlands. This area has been protected from development and has recently began to undergo a restoration project that will not only provide both marine and terrestrial plants and animals with healthier habitat, but will also provide human access to and enjoyment of a naturally occurring habitat that has all but vanished.

Some present environmental amenities at Bolsa Chica Wetlands include:

- Fishing
- Hiking
- Bird Watching
- Scenic Tours
- Bicycling or jogging along the boardwalk
- Recreational Photography

Please flip to card L. Presently only a small portion of the Bixby Ranch land is a natural salt marsh wetland ecosystem. There is, however, the potential for a much more expansive salt marsh wetland ecosystem, like that of Bolsa Chica.

In reaching this potential, there are two problems that have been identified. The first is the purchasing of lands adjacent to the existing Los Cerritos Wetlands. The second is the additional funds necessary to purchase as well as maintain/ restore the Los Cerritos Wetlands.

One proposal is to create a Los Cerritos Restoration Land Trust financed by taxes. Proceeds from this fund would pay for the acquisition of the Bryant and Hellman Ranch properties, reconnecting and restoring the now separated estuary remnants.

We are going to ask you if you are willing to pay additional taxes. Before we ask you our question, think about referendums on the ballot that allow you to vote in favor of programs to improve the environment. Those votes, you actually give permission to increase your taxes. Since you are not actually voting on a referendum, the increase in taxes is hypothetical. Some researchers are concerned that when payment is hypothetical people will over state the amount they are willing to allow taxes to be raised. We call this hypothetical bias, the difference between the amounts people respond to hypothetical situations as compared to real situations. We want to get people to think about their taxes in a hypothetical setting like they think in a real situation, where if they agree, their taxes really will be raise, and they will really have to dig into their pockets and pay money.

Now please look at card M. This is the area of the wetlands that we are going to ask you how much you would be willing to pay to see restored.

Q7. Please flip to card N. How much would you be willing pay based on the amounts on the card in annual taxes to restore this portion of the wetlands?

Section E: Travel Time- Household Wage, Income, Residence

I would like to ask you about your background. This information will help us understand what you are willing to give up in terms time and wages in order to participate in outdoor recreation.

Q8. In what zip code do you live?

Q9. Are you employed part time or full time?

If neither, are you a homemaker, student, retired, etc?

Q10. If part time how many hours do you work in a given week?

Q11. If full time, how much time do you receive for vacation?

Now please look at card O.

Q12. Which describes your monthly take-home pay?

Please look at card P.

Q13. Which describes the total annual income, before taxes, for everyone in your household?

Section G: Socioeconomic Variables

Q14. What is your age?

Please look at card Q.

Q15. What is your highest level of education?

Q16. How many people other than yourself live in your household?

Q17. What are their ages?

Q18. How many are wage earners?

Q19. Do you currently belong to any environmental organizations?

If so, can you recall which ones?

Section H: Interviewer information

Sex: M or F

Race: White Black Hispanic Asian Other

The respondent was:

	Not at all	Slightly	Somewhat	Very	Extremely
Distracted					
Attentive					
Interested					
Impatient					

Did the respondent say anything suggesting that he/she had any difficulty understanding what the Wetland is?

Appendix B: INTERVIEWER SHEET

Interviewer	Location
Date	Start Time

1.

	1. Not Important at all	2. Not too important	3.Somewhat Important	4. Very Important	5.Extremely Important
a. Maintain Beach Cleanliness					
b.Maintain/Improve Marine Wildlife Habitat					
c. Maintain/Improve Water Quality					
d. Marine Safety					
e. Wildlife Protection					
f. Coastal Development					

2.

3.

4.

5. ____ Yes ____ No ____ Not Sure

6. ____ Yes ____ No ____ Not Sure

7.

8.

9. part time full time

10.

11.

12.

13.

14.

15.

16.

17.

18.

19.

Interviewer information

End Time: _____

Sex: M or F

Race: White Black Hispanic Asian Other

The respondent was:

	Not at all	Slightly	Somewhat	Very	Extremely
Distracted					
Attentive					
Interested					
Impatient					

Did the respondent say anything suggesting that he/she had any difficulty understanding what the Wetland is?

Appendix C: CARDS A through P

CARD A

	1. Not Important at all	2. Not too important	3.Somewhat Important	4. Very Important	5.Extremely Important
a. Maintain Beach Cleanliness					
b.Maintain/Improve Marine Wildlife Habitat					
c. Maintain/Improve Water Quality					
d. Marine Safety					
e. Wildlife Protection					
f. Coastal Development					

The Los Cerritos Wetlands



Card B Side 2



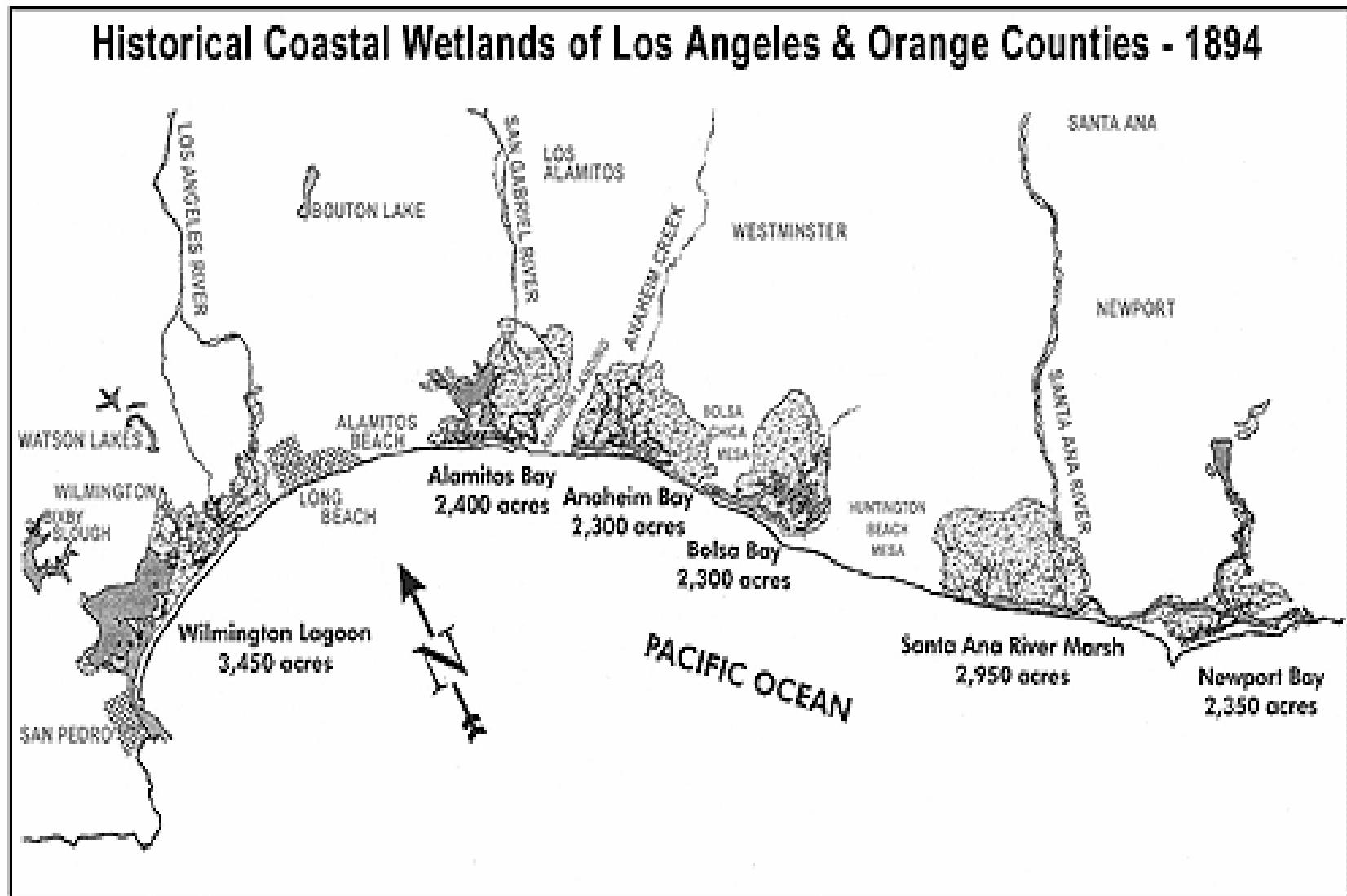
Card C Side 1



Card C Side 2



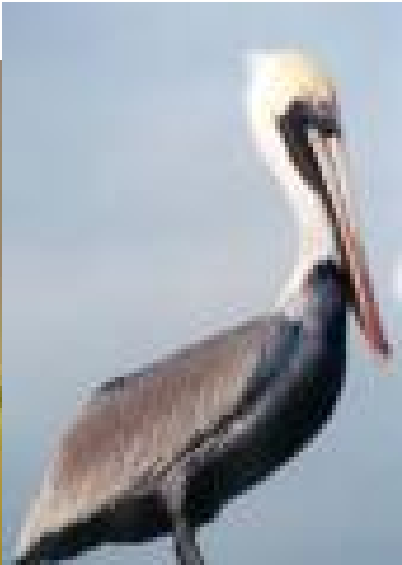
Card D



Card E



Belding's Savannah Sparrow



Brown Pelican



Forster's Tern



Forster's Tern

Card F



Long Billed Curlew

Card G



Dunlin



Snowy Egret

Card H



Caspian Terns and Ring-billed Gulls

Card I



Snowy Plover



Belding's Savannah Sparrow

Card J



least tern



light footed clapper rail

Card K Side 1: Bolsa Chica



Card K Side 2: Bolsa Chica



CARD L SIDE 1

Los Cerritos Wetlands is an island of natural habitat surrounded by a sea of humanity and it is especially valuable because it is unfragmented habitat connecting the Seal Beach National Wildlife Refuge and El Dorado Nature Center.



CARD L SIDE 1

Our Purpose:

The Los Cerritos Wetlands Land Trust for Long Beach and Seal Beach seeks to Acquire, Restore, Preserve and Protect the former estuary of the Lower San Gabriel River in southeast Los Angeles Co. and northwest Orange Co. in the State of California, its Tidal Salt Marsh, Riparian Habitats and a buffer of Coastal Sage Scrub Habitats.



Recovery of the Watershed and ocean fisheries that once thrived in Long Beach depend upon Estuary restoration, as do the migrating birds



Los Cerritos Wetlands is the year-round home for a dozen State or Federally listed plants, fish, invertebrates, mammals and birds like Belding's Savanna Sparrow (above) and is used as a foraging area by Osprey, Bald Eagle, Brown Pelican and California Least Tern, (below)



Once a major nesting site for endangered Least Terns, Western Snowy Plovers and myriads of seabirds; a restored estuary will enable their recovery.



Land Trust
for
Long Beach and
Seal Beach

dedicated to
Preserving and Restoring
the Estuary of the
San Gabriel River

(562) 293-3011
P.O. Box 30165
Long Beach, CA 90853

Card M: I



Card M: I, II



Card M: I II III



Card N

- A. Less than \$10
- B. \$10
- C. \$15
- D. \$20
- E. \$25
- F. \$30
- G. \$40
- H. \$50
- I. \$60
- J. \$75
- K. \$100
- L. Greater than \$100

CARD O

A. Less than \$200

B. \$300

C. \$400

D. \$500

E. \$600

F. \$700

G. \$800

H. \$900

I. \$1000

J. \$1200

K. \$1400

L. \$1600

M. \$1800

N. \$1900

O. \$2100

P. \$2300

Q. \$2500

R. \$2700

S. \$2900

T. \$3100

U. \$3300

V. \$3500

W. \$3700

X. \$3900

Y. \$4000

Z. Greater than \$4000

CARD P

A. Less than \$5000

B. \$10,000

C. \$15,000

D. \$20,000

E. \$25,000

F. \$30,000

G. \$35,000

H. \$40,000

I. \$50,000

J. \$60,000

K. \$70,000

L. \$80,000

M. \$90,000

N. \$100,000

O. \$120,000

P. \$140,000

Q. \$160,000

R. \$180,000

S. \$200,000

T. Greater than \$200,000

Appendix D: See separate Excel Spreadsheet

Appendix E: Phase I regression results

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.435979
R Square	0.190078
Adjusted R	0.059445
Standard E	22.28409
Observatio	37

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>ignificance F</i>
Regressor	5	3612.757	722.5515	1.455054	0.23279
Residual	31	15394	496.5806		
Total	36	19006.76			

	<i>Coefficient</i>	<i>standard Err</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	32.4354	18.09544	1.792463	0.082824	-4.470492	69.3413
Household	6.63E-05	0.000102	0.652012	0.519199	-0.000141	0.000274
EDUCATIC	0.457342	3.613698	0.126558	0.900108	-6.912844	7.827528
ENVIRONM	-21.18206	9.659908	-2.192781	0.035953	-40.88357	-1.480549
AGE- Que	0.129885	0.382904	0.339209	0.736739	-0.651053	0.910822
GENDER	12.15804	9.111486	1.334364	0.191804	-6.42496	30.74104

Phase 1

AVERAGES		
Intercept	32.4354	
Household	6.63E-05	94324.32
EDUCATIC	0.457342	3.297297
ENVIRONM	-21.18206	0.810811
AGE- Que	0.129885	39.27027
<u>GENDER</u>	<u>12.15804</u>	<u>0.5</u>

The Average amount a person is WTP in additional taxes per year for Phase 1 is \$32.44

The Average amount a person is WTP in additional taxes per year for Phase 1 for every \$10,000 increase in income is \$0.66.

The Average amount a person is WTP in additional taxes per year for Phase 1 for every increased level of education is \$0.46.

The Average amount a person is WTP in additional taxes per year for Phase 1 increases by \$21.18 if they belong to an environmental group.

The Average amount a person is WTP in additional taxes per year for Phase 1 decreases by \$0.13 per additional year of age.

The Average amount a woman is WTP in additional taxes per year for Phase 1 is \$12.16 more than a man would in similar circumstances.

According to CA Department of Finance, Demographic Research Unit the January 2006 Long Beach population is 490,166.

The Seal Beach 2006 Population is 25,298.

The adults (ages 18 and over) make up about 70% of the population.

$$y = B_0 + B_1x + B_2z$$

490,166 pe 515464

515,464 pe 360824.8

360,824.8 | 12341197

Appendix F: Phase II regression results

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.462616
R Square	0.214013
Adjusted R	0.087241
Standard E	23.5327
Observatio	37

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>ignificance F</i>
Regressor	5	4674.459	934.8919	1.688176	0.16686
Residual	31	17167.43	553.7881		
Total	36	21841.89			

	<i>Coefficient</i>	<i>standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	36.63106	19.10936	1.916917	0.064506	-2.342734	75.60485
Household	5.81E-05	0.000107	0.540604	0.592644	-0.000161	0.000277
EDUCATIC	1.788988	3.81618	0.46879	0.6425	-5.994161	9.572138
ENVIRONM	-24.16958	10.20117	-2.369295	0.024231	-44.975	-3.364155
AGE- Que	0.117085	0.404359	0.289557	0.774083	-0.70761	0.94178
GENDER	12.08174	9.622018	1.255635	0.218631	-7.542497	31.70597

Phase 2

AVERAGES		
Intercept	36.63106	
Household	5.81E-05	94324.32
EDUCATIC	1.788988	3.297297
ENVIRON	-24.16958	0.810811
AGE- Que	0.117085	39.27027
<u>GENDER</u>	<u>12.08174</u>	<u>0.5</u>
	0.580578	

The Average amount a person is WTP in additional taxes per year for Phase 2 is \$36.63.

The Average amount a person is WTP in additional taxes per year for Phase 2 for every \$10,000 increase in income is \$0.58

The Average amount a person is WTP in additional taxes per year for Phase 2 for every increased level of education is \$1.79.

The Average amount a person is WTP in additional taxes per year for Phase 2 increases by \$24.17 if they belong to an environmental gro

The Average amount a person is WTP in additional taxes per year for Phase 2 decreases by \$0.12 per additional year of age.

The Average amount a woman is WTP in additional taxes per year for Phase 2 is \$12.08 more than a man would in similar circumstances

According to CA Department of Finance, Demographic Research Unit the January 2006 Long Beach population is 490,166.

The Seal Beach 2006 Population is 25,298.

The adults (ages 18 and over) make up about 70% of the population.

$$y=B_0+B_1x+B_2z$$

490,166per 515464

515,465per 360824.8

360,824.8 | 14089490

Appendix G: Phase III regression results

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.521488
R Square	0.271949
Adjusted R	0.154522
Standard E	24.86699
Observatio	37

48.63156

1.663246

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>ignificance F</i>
Regressior	5	7160.353	1432.071	2.315891	0.067324
Residual	31	19169.38	618.367		
Total	36	26329.73			

	<i>Coefficient</i>	<i>standard Err</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	44.6634	20.19284	2.211843	0.034479	3.479832	85.84697
QUES. 13-	0.000166	0.000113	1.465629	0.15282	-6.51E-05	0.000398
QUES. 15-	2.416066	4.032553	0.59914	0.553433	-5.808381	10.64051
QUES. 19-	-27.18436	10.77957	-2.521842	0.017026	-49.16943	-5.199291
Ques. 14-a	-0.153658	0.427286	-0.359615	0.721573	-1.025113	0.717796
GENDER	10.11309	10.16758	0.994642	0.327611	-10.62382	30.85

PHASE 3

AVERAGES		
Intercept	44.6634	
QUES. 13-	0.000166	94324.32
QUES. 15-	2.416066	3.297297
QUES. 19-	-27.18436	0.810811
Ques. 14-a	-0.153658	39.27027
GENDER	10.11309	0.5

The Average amount a person is WTP in additional taxes per year for Phase 3 is \$44.66.

The Average amount a person is WTP in additional taxes per year for Phase 3 for every \$10,000 increase in income is \$1.66.

The Average amount a person is WTP in additional taxes per year for Phase 3 for every increased level of education is \$2.42.

The Average amount a person is WTP in additional taxes per year for Phase 3 increases by \$27.18 if they belong to an environmental group.

The Average amount a person is WTP in additional taxes per year for Phase 3 decreases by \$0.15 per additional year of age.

The Average amount a woman is WTP in additional taxes per year for Phase 3 is \$10.11 more than a man would in similar circumstances.

According to CA Department of Finance, Demographic Research Unit the January 2006 Long Beach population is 490,166.

The Seal Beach 2006 Population is 25,298.

The adults (ages 18 and over) make up about 70% of the population.

$$y = B_0 + B_1x + B_2z$$

490,166per 515464

515,465per 360824.8

360,824.8 | 0