Final Status Report

Design and Evaluate Communication Strategies to Mitigate Visitor Use Impacts at Pelican and Cormorant Non-breeding Sites

(July 2008-December 2011)

Prepared by

Carolyn J. Ward (Principal Investigator)
Steven R. Martin (Principal Investigator)
and Jennifer Taylor

Department of Environmental Science and Management
Humboldt State University
Arcata, CA 95521

In cooperation with
Bureau of Land Management
Arcata Field Office
Arcata, CA 95521

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Carolyn J. Ward, Ph.D.
Steven R. Martin, Ph.D.
Jennifer Taylor
Department of Environmental Science and Management
Humboldt State University

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EXECUTIVE SUMMARY

The purpose of this study was to design, implement and evaluate communication strategies needed to effectively protect roosting and resting seabirds, primarily the brown pelican and cormorants, and meet the needs of both the visitors and land managers. The study occurred in three phases. Develop appropriate educational and interpretive messages and interventions to reduce depreciative behavior, educate the public, and promote positive attitudes toward protection of targeted species and habitats (Phase I), design and implement the interpretive interventions (Phase II), and assess the overall effectiveness of those interventions, and produce a final report with transferrable models for behavioral-modification techniques for wildlife-human interactions (Phase III).

Figure 1. Sign posted at Field's Landing

The educational interventions developed were a sign, a brochure, and a uniformed volunteer. The interventions were designed using best practices in the field of natural resources interpretation. The sign and brochure were short, colorful, and visually pleasing. The talk given by the uniformed volunteer was also short and message driven. Each was tested at different times at four sites in Humboldt County, CA: South Spit, Field's Landing, Samoa Dunes, and Big Lagoon.

Figure 2. Visitor reading interpretive sign

Data collection for Phase II occurred from July through September 2010. Three different data collection methods were used: self- report survey, interview, and observation. The survey was administered to 110 visitors, another 45 visitors participated in the interview, and there were 168 observations made. Data from these respondents was used to evaluate the overall effectiveness of the interventions.

Figure 3. Visitor being interviewed by researcher

Visitor Characteristics

Phase II data shows that approximately 53% of visitors were male and most visitors were between the ages of 50 and 59 years (26%). A majority of users were white (82%) and only 26% of visitors had a college degree. Nearly 85% of visitors were local, from Humboldt County and 79% of visitors had been to the site before; 80% had visited ten or more times.

Visitor Knowledge

In the survey, visitors were asked three questions intended to test their knowledge of pelicans and cormorants. Visitors provided many correct answers to the questions, such as “people” and “dogs off leash” causing pelicans and cormorants to leave their roosting site. Visitors provided numerous correct responses that showed they were learning information from the interventions; however, the increases were not statistically significant.

Interpretive interventions and Messages

The data showed that the uniformed volunteer was more effective than the sign, which was more effective than the brochure at producing correct answers to the knowledge questions. Visitors did a great job at identifying and remembering main messages from the interventions. In the survey, 88% of responses from visitors who remembered a message were correct.

Visitor Behavior

Many positive behaviors were noted in the Phase II interviews. They included keeping a dog on-leash, kayaking away from rocks, on rocks away from birds, and staying away from birds, rocks, and water. When Phase II was compared with Phase I, the behaviors were significantly better in Phase II ($p<0.000$).

Disturbances

An analysis of interview data showed that there was only one disturbance observed by the interviewer. That disturbance was a dog off-leash causing cormorants to depart. Combining interview and observation data, the total number of disturbances in Phase II (n=10) was far fewer than in Phase I (n=25).

Figure 4. Visitor completing survey

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Introduction

The purpose of this study is to design, implement and evaluate communication strategies needed to effectively protect roosting and resting seabirds, primarily the brown pelican and cormorants, and meet the needs of both the visitors and land managers. As California's human population grows, more people recreate in the marine environment, affecting wildlife in marine ecosystems, particularly along the California coastline (CA DFG website). Many of these habitats allow for recreational use and human disturbance can be a product of that use. Nearly one-third of Americans reported wildlife related recreation with over 66 million people reporting feeding, photographing or observing wildlife in 2001 (USDI, 2001). Disturbance effects on non-breeding birds (roosting, resting, and foraging sites) have been measured in terms of changes in behavior, habitat use and distribution, total numbers, heartbeat rate, and physiological condition (Stalmaster and Newman, 1978; Burger, 1981(a, b); Jaques and Anderson, 1988; Jaques, Strong & Keeny, 1996; Josselyn, et al 1989; Culik, et al. 1990; Gaston, 1991; Klein, 1993).

When dealing with a public that has open and free access to the resource, and when prohibiting or limiting use is difficult or impossible, education or interpretation may be the only method to change visitor behavior. Interpretation has long been touted as an appropriate light-handed method of accomplishing many management goals including; reducing depreciative visitor behaviors, protecting resources, educating the public, increasing visitor support for resources and management agencies, reducing visitor conflicts, and satisfying visitor needs and expectations (Ham, 1992, Knopf & Dustin, 1992; Knudson, Cable & Beck, 1995; Martin, 1992; Morgan, Absher, Louden & Sutherland, 1997; Moscardo, 1999; Roggenbuck, 1992; Roggenbuck and Berrier, 1982; Vander Stoep & Gramann 1987, Ward, 2006; Ward & Wilkinson, 2006).

This study provides a unique opportunity to create baseline data regarding the effectiveness of a communication strategy to protect non-breeding pelican and cormorant habitats about which the public has received relatively little information. Once completed, this study can be adapted and applied to protect a broader scale of wildlife resources along the entire California coast, including many of the offshore rocks associated with the California Coastal National Monument.

The study occurred in three phases:

- Develop appropriate educational and interpretive messages and interventions to reduce depreciative behavior, educate the public, and promote positive attitudes toward protection of targeted species and habitats (Phase I)
- Design and implement the interpretive interventions (Phase II), and
- Assess the overall effectiveness of those interventions, and produce a final report with transferrable models for behavioral-modification techniques for wildlife-human interactions (Phase III).

Study Goals and Objectives

The final component of the study (Phase III) involved the assessment of the overall effectiveness of the new communication services and strategies (the experimental interventions) as compared to the baseline behavior established in Phase I. Recommendations and models for behavioral modification techniques to influence human-wildlife interactions were created. Those recommended strategies will be disseminated to a larger audience via conference presentations, trainings and outreach conducted with adjacent locations experiencing similar human-wildlife interactions and issues such as Crescent City, and workshops conducted with other management agencies charged with managing and mitigating human-bird interactions

1. Analyze data to assess effectiveness of messages and mediums in terms of attention and message retention;
2. Determine the relationships among visitor needs, preferences, uses of interpretive services, and subsequent satisfaction levels;
3. Determine level of behavioral impact due to message reception and retention;
4. Assess the effectiveness of the messages and mediums in relation to human disturbances to roosting and resting seabirds using the data collected in Phase I and II;
4. Make final recommendations regarding methods for minimizing negative human-wildlife interactions;
5. Final report to the Trustee Council at the end of each calendar year;
6. Targeted community and agency outreach to disseminate lessons learned.

Methodology

Phase III used data collected in Phase I and Phase II to draw conclusions about visitor populations, their knowledge, and their behavior toward pelicans and cormorants. The following is a summary of Phase I and Phase II methodology in order to show how the data led to the final analysis.

<u>Phase I</u>

In Fall 2008, twenty one sites along the North Coast from South Spit to Big Lagoon were observed. Information was collected on the number of pelicans and cormorants present at each site, the number of people present at each site, and the type and frequency of human-bird interactions that resulted in a disturbance to pelicans or cormorants. Six sites were ultimately selected from that process for further study: South Spit, Fields Landing, King Salmon, Samoa Dunes, Trinidad, and Big Lagoon. Those six sites were the focus of Phase I data collection.

Phase I data collection took place between July 1, 2009 and October 31, 2009. Data was collected through survey, interview, and observation. Instruments were pilot tested in the spring

of 2009 and refined prior to use in Phase I data collection. Surveys and observations were conducted by one research assistant and interviews were conducted by another.

Surveys were printed and placed on clipboards with pens. The research assistant approached all visitors to each site and asked them to complete the survey on-site. The surveys were then returned to the research assistant on-site after completion.

Interviews were conducted based on the research assistant's observations of a particular visitor's behavior. The research assistant discreetly observed each visitor's behavior when the visitor arrived at the site. After observing any negative or positive behaviors, the research assistant approached the visitor to ask questions mainly about why the visitor conducted the behavior. Questions were also asked about what messages the visitor could have received at the site that would have prevented him or her from conducting that negative behavior. Based on responses received up to that point, the researchers drafted potential messages in October 2009 and began testing those in the interviews as well. The purpose of this was to obtain visitor opinions on a message's effectiveness. This helped the researchers create more effective messages for Phase II of the study.

Observations were conducted of visitors, pelicans and cormorants, and types of disturbance. The research assistant was placed at each site where visitors could not easily notice her and where she herself would not be a disturbance to the pelicans or cormorants. All observations were recorded on observation logs.

Phase II

In the beginning of Phase II, researchers identified specific target audiences that frequent the study sites. Two main audiences were found primarily based on the frequency of use and are identified as experienced and non-experienced users. The experienced target audience is local residents who have visited the parks frequently over a long period of time. In some instances, visitors have been coming to a site since they were children. These visitors have a great deal of ownership of the parks and are wary of any changes that a government agency may enforce. They often do not see bird disturbances as a problem. The other primary target audience is visitors to the area who are either novice (first-time) users or who may have been before, but do not know much about the environment around them. The disturbances these visitors cause are often the result of a lack of knowledge. They are anxious to learn information about their surroundings and are more likely to be both receptive to and influenced by behavior change targeted messages.

Based on the responses given in Phase I and on the observations of visitor behavior, one message was created that incorporated multiple levels of appeal to reach each of the primary target audiences identified through Phase I. Since the most negative behaviors were caused by local or experienced users and due to their self-perceived 'expertise" on the site, it was important to create a message that would grab their attention. The hook, "Why Should I Care," was used and then inform about how bird disturbances can affect their experience and the environment they feel such ownership of was given. Another aspect of the message was designed based on both the reported motivations and observed activities that visitors gave for visiting the sites.

Many local visitors frequent the sites to fish. To make the message more meaningful to these visitors, it also explained how healthy bird populations affect fishing. In addition, local visitors often know a great deal about the site. Presenting the information in a novel way can result in those visitors becoming more mindful as the read the message and therefore processing the content more thoroughly. Higher level information processing can be more important for changing both attitudes and behavior toward the birds.

For the non-local visitor, information was provided about where pelicans and cormorants can be found, what roosting is, and why roosting is necessary for species survival. The target message of staying back 75 feet (the distance determined in Phase I that birds flush due to visitors) was illustrated with the analogy that 75 feet is the same distance as two school busses. This message was also presented graphically. Since the gain of knowledge in a particular subject area often impacts the attitudes and behavior surrounding the subject, it was important to provide visitors with basic information about the birds. After being presented with this information, visitors could ultimately make informed decisions regarding their behavior toward the birds.

Three different intervention mediums (sign, brochure and uniformed volunteer) were used to present the message to the visitors. Each method has its own strengths and weaknesses for communicating with visitors and was developed to maximize those individual strengths and minimize the weaknesses.

The first medium was a sign placed on a post near the entrance to each of the study sites. This medium was chosen because it is used frequently to present information to visitors and is readily accepted by them as a primary source of management related messaging. In addition, signs are relatively inexpensive per visitor contact. The sign was designed using both a written tiered approach to convey the message and graphics that supported the written message. Conveying the message through both text and graphics can lead to better comprehension and retention of the main message. One drawback to using signs is that they are subject to vandalism. The sign in this study measured approximately three feet wide by two feet high. Bright colors were chosen to attract the attention of visitors. A broken border at the top of the sign in the shape of waves was also used to make the sign more novel in attempts to gain the attention of repeat experienced users. Detailed pictures and a very concise amount of text were used to get the message across quickly to the typical reader who does not read a sign for more than a few seconds.

The second medium used to deliver the message was a brochure placed on a post near the entrance to each of the study sites. Brochures have many of the same positive qualities as signs, such as a quick and easy way to communicate information and graphics to visitors. They are the most widely used form of communication in natural resource management. Brochures can be more valuable because they can be accessible at the point of behavioral choice. Since brochures can be taken with visitors on a walk to help them identify the birds, they are a more proximal intervention to the opportunity to perform the negative behavior. Brochures also have take-home value and can be shared with others or used as a souvenir to remind visitors of their trip. Brochures can be costly per visitor contact, require restocking and may be thrown away or left on the ground. The brochure was developed with the same text, colors and borders as the sign. By having the same text and format for the sign and the brochure, it will be easier to determine

the relative impact of the method used to communicate the message. The brochure measured four inches wide and nine inches high. The brochure holder was made of plexiglass and was placed on the post at the entrance to the park. There was a small sign placed on the top of the brochure holder stating, “Get the Facts! Please take one.”

The third method tested was a uniformed volunteer. Since the uniformed volunteer comes face to face with the visitor, it may be harder for the message to be ignored. In addition, the uniformed volunteer is not static or fixed in place. They can answer a visitor’s follow-up questions about the birds or the environment and therefore can provide a deeper more meaningful message. Uniformed volunteers are much less expensive to have in the parks than paid uniformed employees. The volunteer uniform conveys a sense of authority and may deter visitors from participating in negative behaviors. The main disadvantage to using uniformed volunteers is that volunteers set their own schedules, and it can’t always be guaranteed that a volunteer will be there when the visitors need them. In addition, what volunteers say to the public cannot be as closely controlled as a posted sign or printed brochure. In order to maintain consistency throughout the study, the uniformed volunteer was always one of the two research assistants collecting data. The researchers followed the same script:

“Hi, my name is Jennifer. I’m a volunteer here with the BLM. We’re out here talking to visitors today about the pelicans and/or cormorants that roost, or rest here and the importance of keeping your distance from these feathered friends. You can see the pelicans and/or cormorants roosting over there on those rocks. This beach is a critical resting place for them. You can see them with their wings spread wide to dry. That’s because pelicans and cormorants need roosting, or resting time to dry out and make their feathers water resistant to stay warm in the cold water.

Some of the biggest threats to pelicans and cormorants are people, dogs, and boats close to their roosting place, scaring them away. As long as the pelicans and cormorants are here we will have a healthy, balanced ocean and beach for wildlife and people to use. You can help keep the birds here safe by staying back 75 ft (or about two bus lengths) from roosting pelicans and cormorants and by keeping your dog on a leash.”

Data Collection Instruments/Procedures

Phase II data collection included observation of behavior in the presence of the interventions and surveys and interviews conducted with visitors to assess any change in behavior, attitude and knowledge due to exposure to interventions. Four different sites were selected from sites tested in Phase I. They were South Spit, Field’s Landing, Samoa Dunes, and Big Lagoon.

At the beginning of a sign or brochure sampling block, researchers attached either the sign or the brochure holder and brochures to the post placed at the entrance to each study site. The signs and brochures were not permanently placed at the sites due to potential vandalism during times the researchers were not present at a particular site. When the research assistant was assigned to collect surveys on a sampling day, the researcher would wait until the visitor has concluded their visit to the park and then approach them with the survey as the exited the site.

Observations were conducted as inconspicuously as possible. Researchers observed visitors as they arrived at the site and then recorded if they interacted with the intervention and if so, for how long. Researchers then watched visitors throughout their visit to note any disturbing behaviors to the pelicans or cormorants. Disturbance data included type of disturbance, the estimated distance of the disturbance to the seabirds, and the number of birds flushed and their response (number of birds that departed, relocated nearby and number that re-landed at the original site).

When interviews were being conducted, the researcher watched inconspicuously as the visitor first arrived and approached the intervention. The observation sheet was used to record time spent interacting with the tested intervention. The researcher then observed the behavior of the visitor and if any behaviors caused the pelicans or cormorants to flush. As the visitor was leaving the site, the researcher asked the visitor about observed behaviors (positive or negative) and about their knowledge and attitudes toward pelicans and cormorants.

In the uniformed volunteer intervention, two research assistants were on site at the same time. One researcher was dressed in a Bureau of Land Management volunteer shirt and cap. That uniformed volunteer approached the visitors and gave the short talk. Then the other researcher observed visitor behavior at the site and conducted an exit interview, or had the visitor complete a survey on their way out of the site.

Table 1 shows the number of hours that researchers spent at each of the four sites conducting surveys, interviews and observations. The greatest number of hours was spent collecting surveys, with 300 hours of total sampling time.

Table 1. Number of hours of sampling by site and method

	Survey	**Interview**	**Observation**	**Total (Hours)**
South Spit	84	27	72	183
Field’s Landing	60	21	42	123
Samoa Dunes	90	33	54	177
Big Lagoon	66	27	24	117
Total (Hours)	300	108	192	600

Table 2 shows the number of hours spent on each intervention with surveys, interviews, and observation. A total of 600 hours was spent on sampling.

Table 2. Number of hours of sampling by intervention and method

	Survey	Interview	Observation	Total (hours)
Sign	126	54	66	246
Brochure	126	42	66	234
Uniformed Volunteer	48	12	60	120
Total (hours)	300	108	192	600

Table 3 shows the amount of time that each intervention was placed at each site. The uniformed volunteer intervention was only conducted on Bureau of Land Management sites, South Spit and Samoa Dunes.

Table 3. Number of hours of sampling by site and intervention

	Sign	Brochure	Uniformed Volunteer	Total (hours)
South Spit	63	60	60	183
Field’s Landing	63	60		123
Samoa Dunes	60	57	60	177
Big Lagoon	60	57		117
Total (hours)	246	234	120	600

Response Rate

Table 4 shows the number of surveys, interviews, and observations collected at each site. The site with the highest sample size was Samoa Dunes.

Table 4. Sample sizes by site and method

	Survey	Interview	Observation	Total
South Spit	21	7	21	49
Field's Landing	26	4	65	95
Samoa Dunes	32	19	45	96
Big Lagoon	31	15	37	83
Total	110	45	168	323

Table 5 shows the sample sizes according to intervention for each of the three sampling methods. The brochure intervention had the highest combined total of 141.

Table 5. Sample sizes by intervention and method

	Survey	Interview	Observation	Total
Sign	57	21	51	129
Brochure	35	21	85	141
Uniformed Volunteer	18	3	32	53
Total	110	45	168	323

Table 6 shows the amount of data collected at each site during the time each intervention was present. The total sample size was 323.

Table 6. Sample sizes by site and intervention

	Sign	Brochure	Uniformed Volunteer	Total
South Spit	22	14	13	49
Field's Landing*	36	59		95
Samoa Dunes	28	28	40	96
Big Lagoon*	43	40		83
Total	129	141	53	323

**A uniformed volunteer was not tested as Big Lagoon or Field's Landing because they were not BLM managed sites.*

ANALYSIS OF SURVEY DATA

Visitor Characteristics

Gender

Table 7 shows the comparison of Phase I and Phase II data on gender of respondents. In Phase I there were more females than males.

Table 7. (Comparison) Gender of Respondents

Gender	Phase I (n=98)	Phase II (n=100)
Male	42.9%	53.0%
Female	57.1%	47.0%
Total	100.0%	100.0%

Age

Table 8 shows that the ages of respondents were fairly well distributed. Out of all the respondents in Phase II, 42.3% were over the age of 50 years. Table 8 shows that in Phase I, ages were similarly distributed.

Table 8. (Comparison) Age of Respondents

Age	Phase I (n=98)	Phase II (n=97)
18-29 years	13.3%	20.6%
30-39 years	19.4%	18.6%
40-49 years	21.4%	18.6%
50-59 years	12.2%	25.8%
60-69 years	27.6%	11.3%
70+ years	6.1%	5.2%
Total	100.0%	100.0%

Ethnicity

Table 9 shows that the majority of respondents were white (81.5%) in Phase II. This is less than in Phase I.

Table 9. (Comparison) Cultural/Ethnic Identity of Respondents

Cultural/Ethnic Group	Phase I (n=99)	Phase II (n=108)
White	96.0%	81.5%
American Indian/ Alaska Native	3.0%	8.3%
Hispanic/ Latino	2.0%	2.8%
Asian	2.0%	1.9%
Black/ African American	1.0%	0.9%
Native Hawaiian/ Pacific Islander	0.0%	0.0%
Other	1.0%	1.9%

Education

Table 10 shows that only 25.8% of respondents in Phase II had at least one college degree. In Phase I, 60.2% of respondents had at least one college degree.

Table 10. (Comparison) Education Level of Respondents

Education Level	Phase I (n=93)	Phase II (n=93)
Postgraduate	8.6%	8.6%
College Graduate	51.6%	17.2%
Some College	32.3%	35.5%
High school or less	7.5%	38.8%
Total	100.0%	100.0%

Income Level

Table 11 shows that income was distributed among lower income levels. The income level in Phase II with the highest percent of respondents was $20,000-$39,999 (28.3%). This is less than Phase I where 36.7% of respondents made between $60,000 and $79,999.

Table 11. (Comparison) Annual Income Reported by Respondents

Annual Household Income	Phase I (n=60)	Phase II (n=92)
Less than $20,000	1.7%	16.3%
$20,000-$39,999	25.0%	28.3%
$40,000- $59,999	18.3%	25.0%
$60,000- $79,999	36.7%	15.2%
$80,000- $99,999	6.7%	6.5%
$100,000- $119,999	3.3%	6.5%
$120,000 or more	8.3%	2.2%
Total	100.0%	100.0%

Residence

Table 12 shows that an overwhelming majority of respondents came from California (97.9%). Table 12 shows this is similar to Phase I where 89.4% of respondents were from California.

Table 12. (Comparison) Residence by State

State	Phase I (n=94)	Phase II (n=95)
Arizona	1.1%	0.0%
California	89.4%	97.9%
Nevada	3.2%	1.1%
Oregon	4.3%	0.0%
Pennsylvania	1.1%	0.0%
Washington	1.1%	1.1%
Total	100.0%	100.0%

Table 13 shows that surveys were collected from visitors from a variety of counties. Most residents within California were local from Humboldt County (84.6%). Table 13 shows that in Phase I there were more respondents from outside Humboldt County (56.4%) than in Phase II (15.4%).

Table 13. (Comparison) Residence in Humboldt County

County	Phase I (n=94)	Phase II (n=65)
Humboldt County resident	43.6%	84.6%
Outside Humboldt County	56.4%	15.4%
Total	100.0%	100.0%

Group Characteristics

Group Size

Table 14 shows that the most common group size was two people (46.8%).

Table 14. Visitor Group Size

Number in Group	Percent of Respondents (n=109)
1 person	15.6%
2 people	46.8%
3 to 5 people	31.1%
6 + people	6.4%
Total	100.0%

Group Type

Table 15 shows most visitors traveled in family groups (50.5%).

Table 15. Visitor Group Type

Group Type	Percent of Respondents (n=109)
Alone	15.6%
Family Only	50.5%
Friends Only	18.3%
Family and Friends	11.9%
Organized Club	0.9%
Other	2.8%
Total	100.0%

Group Composition by Age Group

Table 16 shows that most people did not visit with children (68.2%).

Table 16. Number of Children in Visitor Group

Number of Children	Percent of Respondents (n=110)
0 children	68.2%
1 child	13.6%
2 children	10.0%
3 – 5 children	6.4%
6 or more children	1.8%
Total	100.0%

Table 17 shows that most people who visited the parks were not seniors, but 19.1% of all visitor groups did contain at least one senior.

Table 17. Number of Seniors in Visitor Group

Number of Seniors	Percent of Respondents (n=110)
0 seniors	80.9%
1 senior	10.0%
2 seniors	9.1%
3 – 5 seniors	0.0%
6 or more seniors	0.0%
Total	100.0%

Past Experience

Table 18 shows that the majority (78.5%) of visitors had visited before. Table 18 also shows that in Phase I, 66.3% of visitors had visited before.

Table 18. (Comparison) Prior Site Experience

Response	Phase I (n=101)	Phase II (n=107)
Previous visits	66.3%	78.5%
No previous visits	33.7%	21.5%
Total	100.0%	100.0%

Table 19 shows that of those who have visited the sites before, 80.0% have visited at least 10 times. Table 19 shows that in Phase I, 51.2% of visitors have visited at least 10 times before. The higher percentage of visitors in the 10 or more category can represent the entrenched local population.

Table 19. (Comparison) Number of Prior Visits of Repeat Visitors

Number of Visits	Phase I (n=43)	Phase II (n=35)
1-2 visits	18.6%	8.6%
3-5 visits	27.9%	8.6%
6-9 visits	2.3%	2.9%
10 or more visits	51.2%	80.0%
Total	100.0%	100.0%

Visit Characteristics

Table 20 shows that as of the time visitors took the survey, most had been in the sites between one and three hours (40.0%).

Table 20. Length of Visit So Far

Length of Visit (Hours: Minutes)	Percent of Respondents (n=100)
0:01-0:30	18.0%
0:31-0:59	2.0%
1:00-3:00	40.0%
3:01-12:00	24.0%
12:01-24:00	7.0%
24:01-48:00	5.0%
48:01-72:00	2.0%
72:01-96:00	0.0%
96:01 or more	2.0%
Total	100.0%

Table 21 shows visitors' reasons for visiting. The most popular reason for visiting was enjoying the scenery (47.3%). The least popular reason was jogging. Responses in the other category include "geo-caching," "Frisbee," and "reading."

Table 21. Reasons for Visiting

Reason	Percent of Respondents (n=110)
Enjoying the scenery	47.3%
Hiking or Walking	31.8%
Dog walking	24.5%
Camping	21.8%
Wildlife Viewing	19.1%
Boating (motorized)	16.4%
Bird Watching	12.7%
Fishing from shore	11.8%
Picnic	9.1%
Swimming or Wading	8.2%
Boating (non-motorized)	6.4%
Surfing	3.6%
ATV	2.7%
Kayaking	2.7%
Jogging	0.9%
Other	2.7%

When the sign was present, 61.4% of visitors said they viewed the sign. When the brochure was present, 28.6% of visitors said they viewed the brochure. When the uniformed volunteer was present, 61.1% of visitors said they spoke to the uniformed volunteer.

Visitor Knowledge

Table 22 compares the number of correct Phase I responses to correct Phase II responses. More visitors provided correct responses in Phase II versus Phase I. According to an independent samples t-test, the difference between the two phases was not significant (p=0.937)

Table 22. (Comparison) Where can you most commonly find pelicans and/or cormorants roosting at this site?

	Phase I (n=101)	**Phase II (n=103)**
Rocks	29.7%	21.4%
Pilings/posts	13.9%	4.9%
Trees	6.9%	11.7%
Near water	5.0%	12.6%
Island	0.0%	1.9%
Cliff	4.0%	0.0%
Levee	1.0%	0.0%
Rooftop	1.0%	0.0%
Don't Know	48.5%	49.5%

Table 22a shows that each answer stated was correct, unless the visitor marked that they did not know the answer to the question. All of the correct answers are in bold italics. Visitors who participated in the uniformed volunteer intervention gave the most correct responses. A one way between groups ANOVA showed no significant difference (p=0.605) among the sign, brochure, and uniformed volunteer groups.

Table 22a. Where can you most commonly find pelicans and/or cormorants roosting at this site?

	Sign (n=55)	**Brochure (n=30)**	**Uniformed Volunteer (n=18)**	**All Methods (n=103)**
Rocks	10.9%	23.3%	50.0%	21.4%
Pilings/posts	7.3%	3.3%	0.0%	4.9%
Trees	14.5%	13.3%	0.0%	11.7%
Near water	18.2%	6.6%	5.5%	12.6%
Island	0.0%	3.3%	5.5%	1.9%
Don't Know	50.9%	53.3%	38.9%	49.5%

Table 23 shows the Phase I responses compared to Phase II responses. According to an independent samples t-test, the difference between the two phases was not significant (p=0.062).

Table 23. (Comparison) Why is it important for pelicans and cormorants to roost?

	Phase I (n=101)	**Phase II (n=102)**
Rest	29.7%	14.7%
Mate	10.9%	23.5%
Nest	6.9%	2.9%
Dry wings	3.0%	12.7%
Live	1.1%	8.8%
Migrate	0.0%	2.0%
Healthy Environment	0.0%	4.9%
Waterproof feathers	0.0%	3.9%
Shelter	0.0%	2.0%
Warm up	0.0%	1.0%
Raise babies	24.8%	0.0%
Protection	3.0%	0.0%
Social contact	2.0%	0.0%
Eat	1.0%	0.0%
Save energy	1.0%	0.0%
Poop	1.0%	0.0%
Don’t know	43.6%	44.1%

Table 23a shows that again the uniformed volunteer intervention produced the most correct responses and the brochure produced the least. A one way between groups ANOVA shows a significant difference (p=0.041) among the sign, brochure, and uniformed volunteer groups. Furthermore, the sign is significantly more effective (p=0.034) than the brochure.

Table 23a. Why is it important for pelicans and cormorants to roost?

	Sign (n=55)	**Brochure (n=30)**	**Uniformed Volunteer (n=17)**	**Total (n=102)**
Rest	18.2%	6.7%	17.6%	14.7%
Mate	20.0%	26.7%	29.4%	23.5%
Nest	0.0%	0.0%	17.6%	2.9%
Dry wings	10.9%	3.3%	35.3%	12.7%
Live	12.7%	6.7%	0.0%	8.8%
Migrate	3.6%	0.0%	0.0%	2.0%
Healthy Environment	9.1%	0.0%	0.0%	4.9%
Waterproof feathers	5.5%	3.3%	0.0%	3.9%
Shelter	3.6%	0.0%	0.0%	2.0%
Warm up	0.0%	0.0%	5.9%	1.0%
Don’t know	40.0%	56.7%	35.3%	44.1%

Table 24 shows the Phase I responses compared to Phase II responses. According to an independent samples t-test, the difference between the two phases was significant p=0.012.

Table 24. (Comparison) What disturbances commonly cause pelicans and cormorants to leave their roosting site?

	Phase I (n=101)	**Phase II (n=104)**
People	25.7%	38.5%
Boats	19.8%	9.6%
Noise	8.9%	8.7%
Habitat damage	8.9%	1.9%
Predators	7.9%	6.7%
Pollution	6.9%	0.0%
Development	4.0%	0.0%
People too close	3.0%	8.7%
Dogs Off Leash	2.0%	17.3%
Guns	2.0%	1.9%
ATV	1.0%	2.9%
Environment hazards	1.0%	1.9%
Don’t know	40.6%	44.2%

Table 24a shows that again the uniformed volunteer intervention was more effective than the sign intervention and the brochure intervention (One way between groups ANOVA, p=0.008). The uniformed volunteer was significantly more effective than the sign (p=0.084) and the brochure (p=0.005).

Table 24a. What disturbances commonly cause pelicans and cormorants to leave their roosting site?

	Sign (n=54)	**Brochure (n=32)**	**Uniformed Volunteer (n=18)**	**Total (n=104)**
People	37.0%	25.0%	66.7%	38.5%
Boats	1.9%	9.4%	33.3%	9.6%
Noise	11.1%	6.3%	5.5%	8.7%
Habitat damage	3.7%	0.0%	0.0%	1.9%
Predators	7.4%	3.1%	11.1%	6.7%
Pollution	0.0%	0.0%	0.0%	0.0%
Development	0.0%	0.0%	0.0%	0.0%
People too close	13.0%	3.1%	5.5%	8.7%
Dogs Off Leash	13.0%	12.5%	38.9%	17.3%
Guns	0.0%	6.3%	0.0%	1.9%
ATV	3.7%	0.0%	5.5%	2.9%
Environment hazards	3.7%	0.0%	0.0%	1.9%
Don’t know	40.7%	59.4%	27.8%	44.2%

Table 25 shows that the uniformed volunteer group best remembered (64.7%) hearing or seeing a message about pelicans or cormorants.

Table 25. Have you heard or seen any messages here about pelicans or cormorants?

	Sign (n=55)	**Brochure (n=32)**	**Uniformed Volunteer (n=17)**	**Total (n=104)**
Seen or heard message	38.2%	28.1%	64.7%	39.4%
Did not hear or see message	61.8%	71.9%	35.3%	60.6%
Total	100.0%	100.0%	100.0%	100.0%

The bold italics in Table 26 shows that everyone who stated an answer was correct, except those in the other group.

Table 26. What was the message you received about pelicans or cormorants?

	Sign (n=21)	**Brochure (n=9)**	**Uniformed Volunteer (n=12)**	**Total (n=42)**
Stay back 75 ft/ 2 bus lengths	28.6%	33.3%	16.7%	26.2%
Keep distance	14.3%	0.0%	50.0%	21.4%
Do not disturb	14.3%	11.1%	33.3%	19.0%
Keep dogs away	14.3%	0.0%	0.0%	7.1%
Respect the ecosystem	9.5%	11.1%	0.0%	7.1%
They need a place to roost/rest	4.8%	0.0%	8.3%	4.8%
They're drying their wings	0.0%	0.0%	8.3%	2.4%
Other- About sign, brochure, person	23.8%	44.4%	0.0%	21.4%

When the sign was present, 45.6% of all visitors said they heard or saw a message about pelicans or cormorants on the interpretive sign. When the brochure was present, 22.9% of all visitors said they heard or saw a message in the interpretive brochure. When the uniformed volunteer was present, 72.2% of all visitors said they heard or saw a message from the uniformed volunteer.

Out of the 21 people in the sign group who remembered a message, 20 people said they received that message from the interpretive sign. Out of the 9 people in the brochure group who remembered a message, 6 people said they received that message from the brochure. Out of the 12 people in the uniformed volunteer group who remembered a message, all 12 people said they received that message from the uniformed volunteer.

Table 27 shows that self-reported mean knowledge stayed relatively the same between Phase I and Phase II. An independent samples t-test showed there was no significant difference between the two phases (p=0.646).

Table 27. (Comparison) Self-reported knowledge of pelicans and cormorants roosting at the site (1 = Not very knowledgeable, 6 = Very knowledgeable)

	Phase I (n=101)	**Phase II (n=103)**
Mean Knowledge	2.19	2.10
Median	2.00	2.00
Standard Deviation	1.376	1.295

Table 27a shows that visitors reported the highest knowledge of pelicans and cormorants after talking to a uniformed volunteer. Visitors reported the least knowledge after participating in the brochure intervention. A one way between groups ANOVA shows a p= 0.107.

Table 27a. Self-reported knowledge of pelicans and cormorants roosting at the site (1 = Not very knowledgeable, 6 = Very knowledgeable)

	Sign (n=54)	**Brochure (n=31)**	**Uniformed Volunteer (n=18)**	**Total (n=103)**
Mean Knowledge	2.15	1.76	2.56	2.10
Median	2.00	1.00	2.00	2.00
Standard Deviation	1.280	1.189	1.423	1.295

Interest in Future Learning

Table 28 shows that, after the interventions, visitors have less interest in learning more about pelicans and cormorants. An independent samples t-test confirms that this difference is statistically significant (p=0.001)

Table 28. (Comparison) Interest in learning more about pelicans and cormorants at the site (1 = Not interested, 6 = Very interested)

	Phase I (n=100)	**Phase II (n=101)**
Mean Knowledge	3.95	3.23
Median	4.00	3.00
Standard Deviation	1.623	1.522

Table 28a shows that the uniformed volunteer group has the highest interest in learning more about pelicans and cormorants at the site. A one way between groups ANOVA shows a p= 0.267.

Table 28a. Interest in learning more about pelicans and cormorants at the site (1 = Not interested, 6 = Very interested)

	Sign (n=52)	**Brochure (n=31)**	**Uniformed Volunteer (n=18)**	**Total (n=101)**
Mean Interest	3.26	2.94	3.67	3.23
Median	3.00	3.00	3.50	3.00
Standard Deviation	1.558	1.459	1.495	1.522

Table 29 shows that in Phase I, there was more interest in the topics than in Phase II.

Table 29. (Comparison) Mean interest in specific topics regarding pelicans and cormorants (1 = Not interested, 6 = Very interested)

	Phase I (n=99)	**Phase II (n=97)**
Feeding behavior	3.69	3.25
Roosting behavior	3.59	3.25
Differences between	3.77	3.28
Significance of	3.92	3.42
Threats to survival	4.05	3.58
Conservation status of brown pelican	4.03	3.71
General information about local seabirds	4.19	3.62

Table 29a shows that again, those who participated in the uniformed volunteer intervention have the highest interest in topics related to pelicans and cormorants and the brochure intervention has the lowest.

Table 29a. Mean interest in specific topics regarding pelicans and cormorants (1 = Not interested, 6 = Very interested)

	Sign (n=51)	Brochure (n=29)	Uniformed Volunteer (n=17)	Total (n=97)
Feeding behavior	3.29	3.09	3.41	3.25
Roosting behavior	3.27	3.12	3.41	3.25
Differences between	3.26	3.28	3.35	3.28
Significance of	3.45	3.26	3.59	3.42
Threats to survival	3.54	3.47	3.88	3.58
Conservation status of brown pelican	3.69	3.53	4.06	3.71
General information about local seabirds	3.64	3.58	3.65	3.62

Table 30 shows there is more interest in flat panel signs in Phase I than in Phase II.

Table 30. (Comparison) Mean preference for how to receive information about pelicans and cormorants (1 = Least preferred, 6 = Most preferred)

	Phase I (n=94)	Phase II (n=81)
Two dimensional/ flat panel signs	4.56	4.42
Brochures	4.16	3.75
Talking with park ranger	4.39	3.48
Audio/visual programs	4.09	2.79

Table 30a shows that most visitors prefer a sign to receive information. However, those who participated in the uniformed volunteer intervention, ranked talking with a park ranger very highly.

Table 30a. Mean preference for how to receive information about pelicans and cormorants (1 = Least preferred, 6 = Most preferred)

	Sign (n=44)	Brochure (n=22)	Uniformed Volunteer (n=15)	Total (n=81)
Two dimensional/ flat panel signs	4.66	3.95	4.40	4.42
Brochures	3.90	3.48	3.77	3.75
Talking with park ranger	3.21	3.29	4.43	3.48
Audio/visual programs	2.86	2.32	3.31	2.79

Table 31 shows that more visitors have a preference for reading information than looking at pictures.

Table 31. (Comparison) Preference for time spent

	Phase I (n=98)	**Phase II (n=84)**
Looking at pictures	44.9%	41.7%
Reading information	28.6%	54.8%
Both	26.5%	3.6%
Total	100.0%	100.0%

Table 31a. Preference for time spent

	Sign (n=42)	**Brochure (n=26)**	**Uniformed Volunteer (n=16)**	**Total (n=84)**
Looking at pictures	35.7%	46.2%	50.0%	41.7%
Reading information	59.5%	50.0%	50.0%	54.8%
Both	4.8%	3.8%	0.0%	3.6%
Total	100.0%	100.0%	100.0%	100.0%

Visitor Beliefs

Table 32 shows the mean belief of importance is less in Phase II than in Phase I. An independent samples t-test shows p=0.013.

Table 32. (Comparison) Belief of importance of pelicans and cormorants to the ecosystem (1 = Not important, 6 = Very important)

	Phase I (n=98)	**Phase II (n=101)**
Mean Importance	5.38	4.94
Median	6.00	6.00
Standard Deviation	1.00	1.434

Table 32a shows that the uniformed volunteer group indicated the highest mean belief of the importance of pelicans and cormorants to the ecosystem.

Table 32a. Belief of importance of pelicans and cormorants to the ecosystem (1 = Not important, 6 = Very important)

	Sign (n=52)	**Brochure (n=31)**	**Uniformed Volunteer (n=18)**	**Total (n=101)**
Mean Importance	5.08	4.61	5.11	4.94
Median	6.00	5.00	5.50	6.00
Standard Deviation	1.426	1.520	1.278	1.434

Table 33 shows there was a lower mean belief of importance in Phase II than in Phase I.

Table 33. (Comparison) Belief of importance of educating the public about pelicans and cormorants (1 = Not important, 6 = Very important)

	Phase I (n=96)	Phase II (n=101)
Mean Importance	5.17	4.83
Median	6.00	5.00
Standard Deviation	1.202	1.429

Table 33a shows that the uniformed volunteer group showed the highest mean belief in the importance of educating the public.

Table 33a. Belief of importance of educating the public about pelicans and cormorants (1 = Not important, 6 = Very important)

	Sign (n=52)	Brochure (n=31)	Uniformed Volunteer (n=18)	Total (n=101)
Mean Importance	4.87	4.68	5.00	4.83
Median	6.00	5.00	5.50	5.00
Standard Deviation	1.521	1.423	1.188	1.429

ANALYSIS OF INTERVIEW DATA

Visitor Characteristics

Residence

Table 34 shows that 45.2% of participants are residents of Humboldt County.

Table 34. Residence in Humboldt County

Response	Percent of Respondents (n=42)
Humboldt County resident	45.2%
Outside Humboldt County	54.8%
Total	100.0%

Table 35 shows that a majority of visitors (72.7%) have visited previously.

Table 35. Prior Site Experience

Response	Percent of Respondents (n=44)
Previous visits	72.7%
No previous visits	27.3%
Total	100.0%

Table 36 shows that most visitors have visited too many times to count.

Table 36. Number of Prior Visits of Repeat Visitors

	Percent of Respondents (n=27)
Every several years/ a few times	33.3%
Annually	14.8%
Several times a year	3.7%
Monthly	0.0%
Several times a month	7.4%
Weekly	0.0%
Several times a week	0.0%
Daily	0.0%
Too numerous to count	40.7%
Total	100.0%

Visit Characteristics

Table 37 shows that fishing and meeting friends or family are the most popular reasons for visiting the sites.

Table 37. Reasons for Visiting

	Percent of Respondents (n=45)
Fishing	17.8%
Meeting friends or family	17.8%
Enjoy weather	13.3%
Playing with kids	11.1%
Recreation	11.1%
Camping	8.9%
Enjoy the scenery	8.9%
Having fun	8.9%
Exercise dog	6.7%
Vacation	6.7%
Watching sea life	4.4%
Boating	2.2%
Enjoy seclusion	2.2%
Kayaking	2.2%
Relaxing	2.2%
Work	2.2%

Visitor Knowledge

Two thirds of the people in the uniformed volunteer group gave complex answers that were found in the presentation given by the uniformed volunteer. A response in the other category is "what I learned from Nemo"

Table 38. Visitor Knowledge of Pelicans

	Sign (n=17)	**Brochure (n=17)**	**Uniformed Volunteer (n=3)**	**Total (n=37)**
Eat fish	52.9%	41.2%	33.3%	45.9%
They've been endangered	11.8%	23.5%	0.0%	16.2%
They live/roost here	23.5%	11.8%	0.0%	16.2%
Big beaks	17.6%	11.8%	0.0%	13.5%
Love to watch them	11.8%	17.6%	0.0%	13.5%
They're a bird	11.8%	17.6%	0.0%	13.5%
They're aquatic	11.8%	0.0%	0.0%	5.4%
There's many of them	5.9%	0.0%	0.0%	2.7%
Migratory	0.0%	5.9%	0.0%	2.7%
People should not get too close	0.0%	0.0%	33.3%	2.7%
Need to dry feathers by sitting on piling	0.0%	0.0%	33.3%	2.7%
Other	0.0%	0.0%	33.3%	2.7%

Table 39 shows that visitors understand the message. They know to keep their distance and why that's important. Responses in the other category included, "there are three kinds here" and "see them all the time."

Table 39. Visitor Knowledge of Cormorants

	Sign (n=13)	**Brochure (n=13)**	**Uniformed Volunteer (n=2)**	**Total (n=28)**
Eat fish	38.5%	38.5%	0.0%	35.7%
They roost and/or nest here	30.8%	23.1%	0.0%	25.0%
Noisy	15.4%	23.1%	0.0%	17.9%
They're black	15.4%	23.1%	0.0%	17.9%
Need to spread their wings	7.7%	7.7%	50.0%	10.7%
Feathers aren't waterproof	0.0%	7.7%	50.0%	7.1%
Keep your distance	7.7%	7.7%	0.0%	7.1%
Similar to pelicans	0.0%	7.7%	50.0%	7.1%
Endangered	7.7%	0.0%	0.0%	3.6%
They're on the pilings	7.7%	0.0%	0.0%	3.6%
Other	7.7%	7.7%	0.0%	7.1%

Table 40 shows that 41.2% of responses included keeping distance between the visitor and the birds. Other comments included, “The cormorants seem ok with it,” “People get in the middle,” and “Black birds are pestering cormorants.” There were no responses given in the uniformed volunteer category.

Table 40. Visitor Knowledge of Interaction Between Pelicans and Cormorants and People

	Sign (n=10)	**Brochure (n=7)**	**Uniformed Volunteer (n=0)**	**Total (n=17)**
Keep your distance	50.0%	28.6%		41.2%
Leave them alone	10.0%	14.3%		11.8%
Pelicans lead to fish	10.0%	14.3%		11.8%
People are not nice to them	10.0%	14.3%		11.8%
They need to roost	10.0%	14.3%		11.8%
Competition for the same fish	10.0%	0.0%		5.9%
Don’t disrupt their wing drying	0.0%	14.3%		5.9%
Other	10.0%	28.6%		17.6%

Table 41 shows that the uniformed volunteer intervention is the most memorable way to disseminate a message, followed by a sign.

Table 41. Visitor Seen or Heard Message about Pelicans or Cormorants

	Sign (n=21)	**Brochure (n=21)**	**Uniformed Volunteer (n=3)**
Seen or Heard Message	66.7%	57.1%	100.0%
Did not see or hear message	33.3%	42.9%	0.0%
Total	100.0%	100.0%	100.0%

Table 42 shows that everyone in the sign and uniformed volunteer group remembered seeing or hearing a message about pelicans or cormorants. Only 83.3% of the brochure group remembered a message.

Table 42. Where Visitor Saw or Heard Message about Pelicans or Cormorants

	Sign (n=14)	Brochure (n=12)	Uniformed Volunteer (n=3)
Sign	100.0%	8.3%	100.0%
Brochure	0.0%	83.3%	0.0%
Uniformed Volunteer	0.0%	0.0%	0.0%
Other	0.0%	8.3%	0.0%
Total	100.0%	100.0%	100.0%

Table 43 shows that almost every message given was one directly from the interventions.

Table 43. Visitor Knowledge of Interpretive Message

	Sign (n=14)	**Brochure (n=8)**	**Uniformed Volunteer (n=3)**	**Total (n=25)**
Keep your distance	21.4%	50.0%	0.0%	28.0%
Stay back 75 ft/2 bus lengths	28.6%	0.0%	33.3%	20.0%
They're roosting out there	21.4%	12.5%	33.3%	20.0%
Don't disturb wing drying	0.0%	25.0%	66.7%	16.0%
Keep dogs on leash/ at home	14.3%	12.5%	0.0%	12.0%
Need healthy balance of ecosystem/ future generations	21.4%	0.0%	0.0%	12.0%
Take care of the beach	14.3%	12.5%	0.0%	12.0%
How glad they must be to be here	14.3%	0.0%	0.0%	8.0%
Don't leave anything out for them	0.0%	12.5%	0.0%	4.0%

Interest in Future Learning

Visitors in the uniformed volunteer group were most interested in learning more about the birds.

Table 44. Visitor Interest in Learning More about Pelicans or Cormorants

	Sign (n=20)	Brochure (n=17)	Uniformed Volunteer (n=1)
Yes	65.0%	70.6%	100.0%
No	15.0%	17.6%	0.0%
Maybe	20.0%	11.8%	0.0%
Total	100.0%	100.0%	100.0%

Table 45 shows that people tended to state the intervention they participated in as the way they learn best.

Table 45. How Visitors Say They Learn Best

	Sign (n=11)	Brochure (n=11)	Uniformed Volunteer (n=1)
Sign	81.8%	36.4%	0.0%
Brochure	18.2%	36.4%	0.0%
Person	0.0%	18.2%	100.0%
Interpretive Center	9.1%	9.1%	0.0%

When visitors were asked what more they would like to learn about, they provided the following responses:

- Why people harass the birds
- If pelicans are still threatened
- Identification of each bird
- Do not restrict use
- Population size
- Where do the pelicans nest
- The life of birds
- About the harbor seals
- About the sand dunes

Visitor Behavior

Table 46a shows behaviors the interviewer noted for each visitor. A chi square test shows no significant difference (p=0.482) among the sign, brochure, and uniformed volunteer groups.

Table 46a. Behavior Interviewer Noted

	Sign (n=12)	**Brochure (n=10)**	**Uniformed Volunteer (n=3)**	**Total (n=25)**
Dog off-leash	0.0%	30.0%	0.0%	12.0%
Dog on-leash/ voice control	25.0%	10.0%	0.0%	16.0%
Out on rocks near birds	16.7%	0.0%	0.0%	8.0%
Out on rocks away from birds	16.7%	30.0%	0.0%	20.0%
Staying away from birds	25.0%	10.0%	33.3%	20.0%
Staying away from rocks	16.7%	0.0%	33.3%	12.0%
Staying away from water	0.0%	20.0%	33.3%	12.0%
Total	100.0%	100.0%	100.0%	100.0%

Table 46b compares behaviors before and after the interventions. According to a chi-square test, the difference between the two phases was significant ($p<0.001$). This means that the interventions positively affected behavior. Some reasons given by visitors for good behavior were "It [the unformed volunteer intervention] changed my plans…I wouldn't have seen the pelicans. I wouldn't have noticed" and "We didn't want them to have to fly."

Table 46b. (Comparison) Behavior Interviewer Noted

	Phase I (n=44)	**Phase II (n=25)**
Kayak close to rocks	11.4%	0.0%
Kayak away from rocks	4.5%	0.0%
Out on rocks near birds	9.1%	8.0%
Out on rocks away from birds	0.0%	20.0%
Boating	4.5%	0.0%
Quad riding	2.3%	0.0%
Scuba diving	2.3%	0.0%
Staying away from birds	0.0%	20.0%
Staying away from rocks	0.0%	12.0%
Staying away from water	0.0%	12.0%
Total	100.0%	100.0%

Table 46c shows dogs on-leash and off-leash for Phase 1 versus Phase 2. During the Phase 2 interventions there was an increase in the proportion of people keeping their dogs on-leash and a decrease in dogs off-leash.

Table 46c. Behaviors the interviewer noted for each visitor with a dog

	Phase I (n=29)	Phase II (n=7)
Dog on-leash	34.5%	57.1%
Dog off-leash	65.5%	42.9%
Total	100.0%	100.0%

Table 47 shows approximately 67% of all visitors stopped to read the sign when it was in place. The mean time spent reading the sign was 31 seconds. The minimum time was 3 seconds. The maximum time was 74 seconds.

Table 47. Sign Intervention

Response	**Percent of Respondents (n=21)**
Appeared not to notice sign	23.8%
Noticed the sign but did not stop to read it	9.5%
Stopped to read sign before starting activities	57.1%
Stopped to read sign after completing activities	9.5%
Total	100.0%

Table 48 shows that approximately 62% of all visitors read the brochure when it was in place. For those who read the brochure while standing at the post where the brochures were located, the mean time spent reading the brochure was 22 seconds. For those who took the brochure to read during their visit, the mean time reading was 45 seconds.

Table 48. Brochure Intervention

Response	Percent of Respondents (n=21)
Appeared not to notice brochure	23.8%
Noticed the brochure, but did not pick up or read	19.0%
Picked up brochure	28.6%
Read brochure at post before activities	42.9%
Read brochure during activities	9.5%
Read brochure at post after activities	9.5%
Took brochure with them when leaving	19.0%

During the interview process, the interviewer saw one disturbance to the cormorants. It was caused by a visitor with a dog off-leash. They had not noticed the brochure when they arrived. The disturbance lasted a total of four minutes and took place fifteen feet from the birds. Two out of 15 cormorants departed.

Table 49 shows that there were many more boat disturbances in Phase I than in Phase II. Since there was only one Phase II disturbance, it is not enough to run any valid statistical tests. It is obvious, however, that the number of disturbances decreased from before to after the interventions.

Table 49. Types of Disturbance as Observed by Interviewer

	Phase I (n=20)	Phase II (n=1)
Dog off-leash	50.0%	100.0%
Person too close	5.0%	0.0%
Boat	35.0%	0.0%
Kayak	5.0%	0.0%
ATV	5.0%	0.0%
Total	100.0%	100.0%

Table 50 shows that 13.3% of cormorants present on-site departed due to a dog off-leash. In comparison, in Phase I, an average of 22.3% of cormorants departed due to a dog off-leash.

Table 50. Disturbance of Cormorants

	Mean % of Cormorants Departed	Mean % of Cormorants Relocated	Mean % of Cormorants Relanded
Dog off-leash (n=1)	13.3%	0.0%	0.0%
Person too close (n=0)	0.0%	0.0%	0.0%
Boat at 50 ft. (n=0)	0.0%	0.0%	0.0%
Kayak (n=0)	0.0%	0.0%	0.0%

ANALYSIS OF OBSERVATION DATA

Table 51 shows that approximately 47% of all visitors stopped to read the sign when it was in place. The mean time spent reading the sign was 19 seconds. The minimum time was 3 seconds. The maximum time was 40 seconds.

Table 51. Sign Intervention

Response	Percent of Respondents (n=51)
Appeared not to notice sign	35.3%
Noticed the sign but did not stop to read it	17.6%
Stopped to read sign before starting activities	35.3%
Stopped to read sign after completing activities	11.8%
Total	100.0%

Approximately 25% of all visitors stopped to read the brochure. For those who read the brochure while standing at the post where the brochures were located, the mean time spent reading the brochure was 20 seconds. For those who took the brochure to read during their visit, the mean time reading was 20 seconds. Since visitors could do more than one option below, the percentages total over 100.0%.

Table 52. Brochure Intervention

Response	Percent of Respondents (n=85)
Appeared not to notice brochure	62.4%
Noticed the brochure, but did not pick up or read	11.8%
Picked up brochure	17.6%
Read brochure at post before activities	16.5%
Read brochure during activities	1.2%
Read brochure at post after activities	7.1%
Took brochure with them when leaving	7.1%

Table 53 shows that in Phase I there were far more boat disturbances than in Phase II. There were slightly more dog disturbances in Phase II. A chi-square test shows p=0.058.

Table 53. (Comparison) Types of Disturbance

	Phase I (n=14)	Phase II (n=9)
Dog off-leash	7.1%	33.3%
Person too close	7.1%	33.3%
Boat	78.6%	22.2%
Kayak	7.1%	11.1%
Total	100.0%	100.0%

Table 53a shows the types of disturbance observed categorized by intervention type. Those visitors who viewed the sign did not cause any disturbances. Those who read the brochure caused the most disturbances.

Table 53a. Types of Disturbance

	Sign (n=0)	Brochure (n=7)	Uniformed Volunteer (n=2)	Total (n=9)
Dog off-leash	0.0%	42.9%	0.0%	33.3%
Person too close	0.0%	28.6%	50.0%	33.3%
Boat at 50 ft.	0.0%	28.6%	0.0%	22.2%
Kayak	0.0%	0.0%	50.0%	11.1%
Total	0.0%	100.0%	100.0%	100.0%

With each disturbance, a certain number of birds already present departed, relocated, or relanded. In order to compare disturbance effects, the number of pelicans or cormorants disturbed is reflected as a percentage of the original number of pelicans or cormorants on site. Table 54 shows the effects disturbances had on pelicans and Table 55 shows the effects disturbances had on cormorants.

Tables 54 and 55 show that the majority of disturbances caused the cormorants to depart completely and not return during the observation period. Dogs off-leash caused 43.5% of cormorants to depart in Phase II, while in Phase I, dogs off-leash caused 100.0% of cormorants to depart.

Table 54. Disturbance of Pelicans

	Mean % of Pelicans Departed	Mean % of Pelicans Relocated	Mean % of Pelicans Relanded
Dog off-leash (n=1)	100.0%	0.0%	0.0%
Person too close (n=1)	0.0%	0.0%	12.5%
Kayak (n=1)	22.7%	45.5%	9.1%

Table 55. Disturbance of Cormorants

	Mean % of Cormorants Departed	Mean % of Cormorants Relocated	Mean % of Cormorants Relanded
Dog off-leash (n=2)	43.5%	10.7%	7.1%
Person too close (n=2)	75.0%	0.0%	25.0%
Boat at 50 ft. (n=2)	100.0%	0.0%	0.0%
Kayak (n=0)	0.0%	0.0%	0.0%

Table 56 shows the observed overall rate of disturbance in Phase I versus Phase II. These observation samples sizes include only the four sites that were sampled in both Phase 1 and Phase 2 in order to allow for a direct comparison. The sample sizes include visitor observations made during both observation and interview data collection.

Table 56. Rate of Disturbance (four sites sampled in both Phase 1 and Phase 2)

	Phase I	**Phase II**
# of Disturbances	25	10
# of Observations	90	213
Rate of Disturbance	27.8%	4.7%

Table 57 shows the comparison of positive versus negative visitor behaviors for Phase 1 and Phase 2. The proportion of negative behaviors decreased drastically and significantly during the Phase 2 interventions.

Table 57. Positive and Negative Behaviors Overall

Behaviors	**Phase I** (n=44)	**Phase II** (n=25)
Positive	27.2%	80.0%
Negative	72.8%	20.0%
Total	100.0%	100.0%

Conclusions

In Phase II of this study people were surveyed, interviewed, and observed. The survey, interview and observation data collection methods were used to evaluate the effectiveness of the sign, brochure, and uniformed volunteer interventions at changing knowledge and influencing behavior. The data was collected at South Spit, Field's Landing, Samoa Dunes and Big Lagoon, all in Humboldt County.

Visitor Characteristics

The following summary of visitors was collected from the Phase II survey responses. Genders were split fairly evenly with 53% of visitors being male and 47% of visitors being female. Most visitors were between the ages of 50 and 59 years (26%) followed by visitors between the ages of 18 to 29 years (21%).

Not surprisingly, a majority of users were white (82%), followed by American Indian/Alaska Native (8%) and Hispanic/Latino (3%). Unlike most recreation areas, the education level of the visitors was quite low. Only 26% of visitors have a college degree and 39% of visitors only have a high school education. Consistent with less education are the lower income levels reported by visitors. The plurality of respondents (28%) reported a household income of $20,000 to $39,999 a year; 25% reported earning $40,000 to $59,999.

Most visitors (98%) are from the state of California. Others were from the nearby states of Nevada (1%) and Washington (1%). Nearly 85% of respondents were from Humboldt County. That means that the visitor population to these parks is very local.

Approximately 47% of visitors came to the parks in groups of two. Groups of three to five were the next most common group size, representing 31% of visitors. Family groups were the most common (51%) group type found in the parks; friends were the next most common (18%) group type. Most groups (68%) had no children with them and no seniors (81%) with them.

The majority (79%) of visitors had been to the site before; 80% had visited ten or more times. The average length of time that a visitor had been in the park was between one and three hours (40%) followed by three to twelve hours (24%).

Visitors were primarily at the sites to enjoy the scenery (47%). They also enjoyed the recreation opportunities the parks had to offer- hiking or walking (32%), dog walking (25%), and camping (22%), Wildlife viewing was stated by 19% of visitors and bird watching was stated by 13% of visitors.

Visitor Knowledge

In the survey, visitors answered three questions intended to test their knowledge of pelicans and cormorants. The first question was "Where can you most commonly find pelicans and/or cormorants roosting at this site? (Question 1)" All Phase II respondents gave correct answers such as rocks (21%) and trees (12%). In response to the question "Why is it important for pelicans and cormorants to roost? (Question 2)" correct answers included rest (15%), dry wings (13%), and waterproof feathers (4%). The final question was "What disturbances commonly cause pelicans and cormorants to leave their roosting site? (Question 3)" Responses included people (39%), dogs off leash (17%), boats (10%), noise (9%), and people too close (9%).

While visitors were able to provide many correct responses to the questions, in comparison to Phase I, there were only a few statistically significant differences. On Question 1, even though all visitors who provided an answer were correct, the increase was not significant ($p=0.937$) compared to Phase I. On Question 2, again, the differences between Phase I and Phase II were not significant ($p=0.062$). Finally, on Question 3, even though the correct response "people" jumped 14% from Phase I to Phase II, the increase was not significant ($p=0.012$).

In the interview, visitors also answered questions designed to test their knowledge of pelicans and cormorants. Visitors were asked what they know about pelicans. There were many different answers given, but the most common one was eat fish (46%). People should not get too close and need to dry feathers by sitting on piling each received 3%. Visitors were then asked what they know about cormorants. Again, the most common response was eat fish (36%). That was followed by they roost or nest here (25%), need to spread their wings (11%), feathers aren't waterproof (7%), and keep your distance (7%). Finally, visitors were asked what they know about the interaction between pelicans and cormorants and people. The majority of visitors correctly stated keep your distance (41%), followed by leave them alone (12%).

Visitor Interests and Beliefs

Visitors were asked questions about their interests in future learning. The first question was if they were interested in learning more about the pelicans and cormorants at the site. All of the responses had a mean of 3.23. Surprisingly, this is significantly ($p=0.001$) less than in Phase I (mean=3.95). Again, when asked about their interest in specific topics regarding pelicans, visitors' interest was less than in Phase I.

Visitors were then asked about the belief of importance of pelicans and cormorants to the ecosystem (mean=4.94) which is less than in Phase I (mean=5.38), and statistically significant ($p=0.013$). Finally, visitors were asked about their belief of importance of educating the public about pelicans and cormorants (mean=4.83). Again the mean was lower than in Phase I (mean=5.17).

Interpretive Interventions and Messages

There were three interpretive interventions tested in Phase II: a sign, brochure, and uniformed volunteer. Each was out by itself at different times in accordance with the sampling plan.

On the first knowledge question "Where can you most commonly find pelicans and /or cormorants roosting at this site?" the uniformed volunteer participants gave the most correct responses (61%), followed by the sign group (51%), and then finally by the brochure group (50%). However, this difference was not statistically significant ($p=0.605$). On the next question "Why is it important for pelicans and cormorants to roost?" it was shown that the sign is significantly ($p=0.034$) more effective than the brochure. On the final question "What disturbances commonly cause pelicans and cormorants to leave their roosting site?" the uniformed volunteer was significantly more effective than the sign ($p=0.084$) and the brochure ($p=0.005$).

When visitors were asked if they had heard or seen any messages about pelicans or cormorants, 64.7% of survey participants in the uniformed volunteer group said yes. This was higher than the sign group (38%) and the brochure group (28%). For the interview participants, 100% of the uniformed volunteer group saw or heard a message, 67% of the sign group, and 57% of the brochure group.

Visitors did an extremely good job at identifying and remembering main messages from the interventions. In the survey, an amazing 88% of responses from visitors who remembered a message were correct. A total of 26% of responses from visitors who remember a message remembered to stay back 75 feet or two bus lengths, and another 21% remembered to keep distance from the pelicans and cormorants. In the interview, 28% of visitors who remembered a message remembered to keep your distance, and another 20% remembered to stay back 75 feet or two bus lengths.

Visitor Behavior

Many positive behaviors were noted in the Phase II interviews. They included keeping a dog on-leash, kayaking away from rocks, on rocks away from birds, and staying away from birds, rocks, and water. When Phase II was compared with Phase I, the behaviors were significantly better in Phase II ($p<0.000$).

In terms of visitor behavior regarding the interventions, in the interview, 67% of all visitors stopped to read the sign when it was in place and 62% of visitors read the brochure when it was in place. In the observations, 47% of visitors stopped to read the sign and 25% stopped to read the brochure.

Disturbances

An analysis of interview data showed that there was only one disturbance observed by the interviewer. That disturbance was a dog off-leash causing cormorants to depart. The number of disturbances in Phase II (n=1) were far fewer than in Phase I (n=17).

There were a total of nine disturbances observed by the researchers during observation data collection. Seven of those were observed of visitors who participated in the brochure intervention and two of those in the uniformed volunteer intervention. For the observation data, there was no significant difference (p=0.175) between Phase II (n=9) and Phase I (n=8). Consistent with Phase I, the majority of disturbances caused the cormorants to depart completely and not return during the observation period

Summary

Overall, the knowledge questions and the messaging questions show that visitors were getting the intended message about keeping their distance from the birds and keeping dogs on leash. Visitor responses to the interest in learning more questions indicate that visitors were satisfied with the information they had just received about pelicans and cormorants and they did not have unanswered questions.

Responses indicated that viewing the sign, the brochure, or talking with a uniformed volunteer onsite were memorable experiences. Visitors responded best to the uniformed volunteer, followed by the sign, and finally by the brochure. The uniformed volunteer provided a brief summary of all the information the visitor needed to know. The volunteer could also travel where a mounted sign and brochure could not. The sign was bright and colorful and offered something new to the visitor population that visits the sites frequently. The brochure could be picked up and read anywhere, however most visitors chose to read the brochure at the post.

Very few negative behaviors were noted in the Phase II interviews. That says that visitors were getting the correct message from the interventions and they were being respectful of the pelicans and cormorants on site. Along with fewer negative behaviors, there were also fewer disturbances noted by the interviewer. This makes sense because when negative behaviors decrease, so should negative disturbances. Observation data shows the same number of disturbances from year to year, but there were far fewer boat disturbances in the second year.

In conclusion, the sign, brochure, and uniformed volunteer interventions worked at increasing knowledge of pelicans and cormorants and decreasing the number of disturbances that cause pelicans and cormorants to depart, relocate, or reland.

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Pelican-Cormorant Study Sampling Plan- Phase II							
south = Field's Landing Boat Ramp, South Spit							
north = Samoa Dunes, Big Lagoon							
UV = Samoa Dunes, South Spit							
S = Sign, B = Brochure, UV = Uniformed Volunteer							
		Interview	Observation	Uniform. Vol	Uniform. Vol	Observation	Survey
		(Jen)	(Jen)	(Jen)	(Kristen)	(Kristen)	(Kristen)
Thur	7/1/2010						
Fri	7/2/2010						
Sat	7/3/2010						
Sun	7/4/2010		south- S				
Mon	7/5/2010						
Tue	7/6/2010		north- B				
Wed	7/7/2010		south- S				
Thur	7/8/2010						
Fri	7/9/2010						south- S
Sat	7/10/2010						south- B
Sun	7/11/2010	UV	UV		UV		
Mon	7/12/2010						
Tue	7/13/2010						
Wed	7/14/2010						north- B
Thur	7/15/2010	south- S					
Fri	7/16/2010	north- S				south- B	
Sat	7/17/2010	north- B					south- S
Sun	7/18/2010						south- B
Mon	7/19/2010						north- S
Tue	7/20/2010		north- S				
Wed	7/21/2010						
Thur	7/22/2010		south- S				
Fri	7/23/2010	north- B				south- S	
Sat	7/24/2010	north- S				south- B	
Sun	7/25/2010					north- B	
Mon	7/26/2010						
Tue	7/27/2010	south- B					
Wed	7/28/2010						south- S
Thur	7/29/2010			UV		UV	UV
Fri	7/30/2010	north- S					
Sat	7/31/2010		south- B				north- S

		Interview	Observation	Uniform. Vol	Uniform. Vol	Observation	Survey
		(Jen)	(Jen)	(Jen)	(Kristen)	(Kristen)	(Kristen)
Sun	8/1/2010	north- B				south- S	
Mon	8/2/2010						
Tue	8/3/2010	south- B					north- S
Wed	8/4/2010			UV		UV	UV
Thur	8/5/2010						
Fri	8/6/2010						
Sat	8/7/2010		north- S				south- B
Sun	8/8/2010	north- S					south- B
Mon	8/9/2010						
Tue	8/10/2010					south- B	
Wed	8/11/2010	south- S					north- B
Thur	8/12/2010						
Fri	8/13/2010		south- B				
Sat	8/14/2010	UV	UV		UV		
Sun	8/15/2010		north- B			south- S	
Mon	8/16/2010	south- S					north- B
Tue	8/17/2010		south- B			north- S	
Wed	8/18/2010						
Thur	8/19/2010						
Fri	8/20/2010						
Sat	8/21/2010	south- B					north- S
Sun	8/22/2010		south- S				north- B
Mon	8/23/2010						
Tue	8/24/2010			UV		UV	UV
Wed	8/25/2010					north- B	
Thur	8/26/2010						
Fri	8/27/2010	south- S					
Sat	8/28/2010		south- B			north- S	
Sun	8/29/2010	north- B					south- S
Mon	8/30/2010						
Tue	8/31/2010	north- S					

		Survey	Observation	Uniform. Vol	Uniform. Vol	Observation	Survey
		(Jen)	(Jen)	(Jen)	(Kristen)	(Kristen)	(Kristen)
Wed	9/1/2010						south- B
Thur	9/2/2010	south- B					north- S
Fri	9/3/2010						
Sat	9/4/2010	north- S					south- B
Sun	9/5/2010	north- S					south- B
Mon	9/6/2010	north- S					
Tue	9/7/2010	UV	UV		UV		
Wed	9/8/2010						
Thur	9/9/2010						
Fri	9/10/2010						north- S
Sat	9/11/2010			UV		UV	UV
Sun	9/12/2010	north- B					south- S
Mon	9/13/2010						
Tue	9/14/2010						
Wed	9/15/2010	UV	UV		UV		
Thur	9/16/2010						
Fri	9/17/2010	south- S					north- B
Sat	9/18/2010	south- S					north- B
Sun	9/19/2010			UV		UV	UV
Mon	9/20/2010						
Tue	9/21/2010						
Wed	9/22/2010	north- B					
Thur	9/23/2010	south- B					north- S
Fri	9/24/2010						north- B
Sat	9/25/2010			UV		UV	UV
Sun	9/26/2010	south- B					north- S
Mon	9/27/2010						
Tue	9/28/2010	south- S					north- B
Wed	9/29/2010						south- S
Thur	9/30/2010	north- B					south- S

Interviews				Sign	Brochure	UV	
south	7		south	4	3		
north	9		north	5	4		
UV	2		UV			2	
weekday	10		weekday	7	3		
weekend	8		weekend	2	4	2	
Observations				Sign	Brochure	UV	
south	14		south	7	7		
north	8		north	4	4		
UV	10		UV			10	
weekday	16		weekday	5	6	5	
weekend	16		weekend	6	5	5	
Surveys				Sign	Brochure	UV	
south	20		south	10	10		
north	22		north	11	11		
UV	8		UV			8	
weekday	28		weekday	12	11	5	
weekend	22		weekend	9	10	3	

APPENDIX B- Phase II Survey

1. How many people are in your group?
   _____ # of seniors (65 or older)
   _____ # of adults (under 65)
   _____ # of children (under 18)

2. How would you describe your group?
   ____Alone
   ____Family only
   ____Friends only
   ____Family and friends
   ____Organized club
   ____Other: please specify_____

3. How long was your visit here today?
   _____ # of hours and/or _____ # of minutes

4. Have you visited this site before?
   ____Yes ____No
   If yes, about how many times? _____

5. What is the reason for your visit here today? (check all that apply)
   ____ Dog walking
   ____ Fishing from shore
   ____ Clamming
   ____ Boating (non-motorized)
   ____ Boating (motorized)
   ____ Kayaking
   ____ ATV use
   ____ Jogging
   ____ Swimming or wading
   ____ Surfing
   ____ Enjoying the scenery
   ____ Bird watching
   ____ Wildlife viewing
   ____ Camping
   ____ Picnic
   ____ Hiking or walking
   ____ Hang-gliding
   ____ Other: please specify _____

6. Have you seen pelicans or cormorants at this site during your visit today?
   ____ Yes ____ No ____ Don't Know

   If yes, how many pelicans? _____ How many cormorants? _____

7. While at this site, which of the following interpretive services have you used?
(check all that apply)
____ Viewed interpretive sign
____ Read interpretive brochure
____ Talked with uniformed volunteer
____ Other: Please describe: _____

8. Where can you most commonly find pelicans and/or cormorants roosting at this site?

_____

_____

Don't Know ☐

9. Why is it important for pelicans and cormorants to roost?

_____

_____

Don't Know ☐

10. What disturbances commonly cause pelicans and cormorants to leave their roosting site?

_____

_____

Don't Know ☐

11a. Have you heard or seen any messages about pelicans or cormorants during your current visit here?
____ Yes ____ No

11b. What was the message you received about pelicans or cormorants?

_____

_____

11c. Where did you hear or see that message about pelicans or cormorants? (check all that apply)
____ Viewed interpretive sign
____ Read interpretive brochure
____ Talked with uniformed volunteer
____ Other: Please describe: _____

12. Please rate how knowledgeable you feel you are about pelicans and cormorants roosting at this location.

Not very knowledgeable——————————— Very knowledgeable
1 2 3 4 5 6

13. Please rate how interested you are in learning more about pelicans and cormorants at this location.

Not interested——————————— Very interested
1 2 3 4 5 6

14. How interested are you in each of the following topics? Circle the number that best represents your level of interest:

	Not Interested					Very interested
a. Feeding behavior of pelicans and cormorants	1	2	3	4	5	6
b. Roosting behavior of pelicans and cormorants	1	2	3	4	5	6
c. Differences between pelicans and cormorants	1	2	3	4	5	6
d. Significance of local pelicans and cormorants	1	2	3	4	5	6
e. Threats to survival of pelicans and cormorants	1	2	3	4	5	6
f. Conservation status of brown pelican	1	2	3	4	5	6
g. General information about local seabirds	1	2	3	4	5	6
h. Other, please specify _____	1	2	3	4	5	6

15. How would you prefer to receive information about pelicans and cormorants at this location? Circle the number that best represents how you would like to receive information:

	Least Preferred					Most Preferred
Two dimensional/flat panel signs	1	2	3	4	5	6
Brochures	1	2	3	4	5	6
Talking with park ranger	1	2	3	4	5	6
Audio/visual programs	1	2	3	4	5	6
Other: please specify _____	1	2	3	4	5	6

16. When looking at signs, do you find yourself spending more time; check only one:

__ looking at pictures
__ reading information

17. Please rate how important you believe pelicans and cormorants are to the ecosystem.

Not important——————————— Very important
1 2 3 4 5 6

18. Please rate how important you believe educating the public about pelicans and cormorants is.

Not important——————————— Very important
1 2 3 4 5 6

Please respond to the following questions about yourself:

19. __ Male __ Female

20. Age _____

21. Which of these groups would you say best represents your race or ethnicity?

___ American Indian/ Alaska Native
___ Native Hawaiian/Pacific Islander
___ Black/African American
___ Hispanic/Latino
___ Asian
___ White
___ Other: please specify _____
___ Prefer not to answer

22. Which of the following categories best describes your annual household income before taxes?

___ Less than $20,000
___ Between $20,000 and $39,999
___ Between $40,000 and $59,999
___ Between $60,000 and $79,999
___ Between $80,000 and $99,999
___ Between $100,000 and $119,999
___ $120,000 or more
___ Prefer not to answer

23. Circle the highest grade you have completed.

Grade school	8 or less
High school	9 10 11 12
College	13 14 15 16 (16= Bachelor's Degree)
Graduate school	17 +

24. Where do you live?

City _____ State _____ Zip Code _____

Other comments:

_____

_____

_____

Thank you!

APPENDIX C- Phase II Interview

Sampling location: Intervention:

Date: Time: Day:

Approximate observed age: Type of group observed:

Is this your first visit here? How many times have you visited before?

Are you from the area? Where are you from?

What is your main reason for visiting? Why is this a good location for that?

Behavior chosen to probe:

Why did you conduct that behavior?

What message could you have received to make you not want to do behavior?

What do you know about pelicans?

What do you know about cormorants?

What do you know about the interaction between pelicans and cormorants and people here?

Have you seen any pelicans or cormorants during your visit?

Have you seen or heard any messages about pelicans or cormorants during your visit here?

Where did you see or hear that message?

What was the message you received about pelicans and cormorants?

Would you be interested in learning more about pelicans and cormorants? Sign, brochure, on-site ranger? What would you like to learn?

Suggestions on how to improve getting the disturbance message to more visitors?

APPENDIX D- Phase II Visitor Observations

Date: _____

Site: _____

Observation Start Time: _____ Observation End Time: _____

1. How many people in group?
   _____ # of seniors (65 or older)
   _____ # of adults (under 65)
   _____ # of children (under 18)

2. What activities are the visitors participating in? (especially note disturbance behaviors)

3. Relevant discussions among visitor group
   Before intervention:

   After intervention:

4. Interpretive intervention present (please circle which one)

Sign:
____ Appeared not to notice sign
____ Noticed the sign, but did not stop to read it
____ Stopped to read sign before starting activities (Time: _____)
____ Stopped to read sign after completing activities (Time: _____)

Comments:

Brochure:
____ Appeared not to notice brochure
____ Noticed the brochure, but did not pick it up
____ Picked up and read brochure at post before starting activities (Time: _____)
____ Picked up and later read brochure during activities (Time: _____)
____ Picked up and read brochure at post after completing activities (Time: _____)
____ Picked up brochure and took it home

Comments:

Uniformed Volunteer:

Length of conversation (Time: _____)

What was discussed?

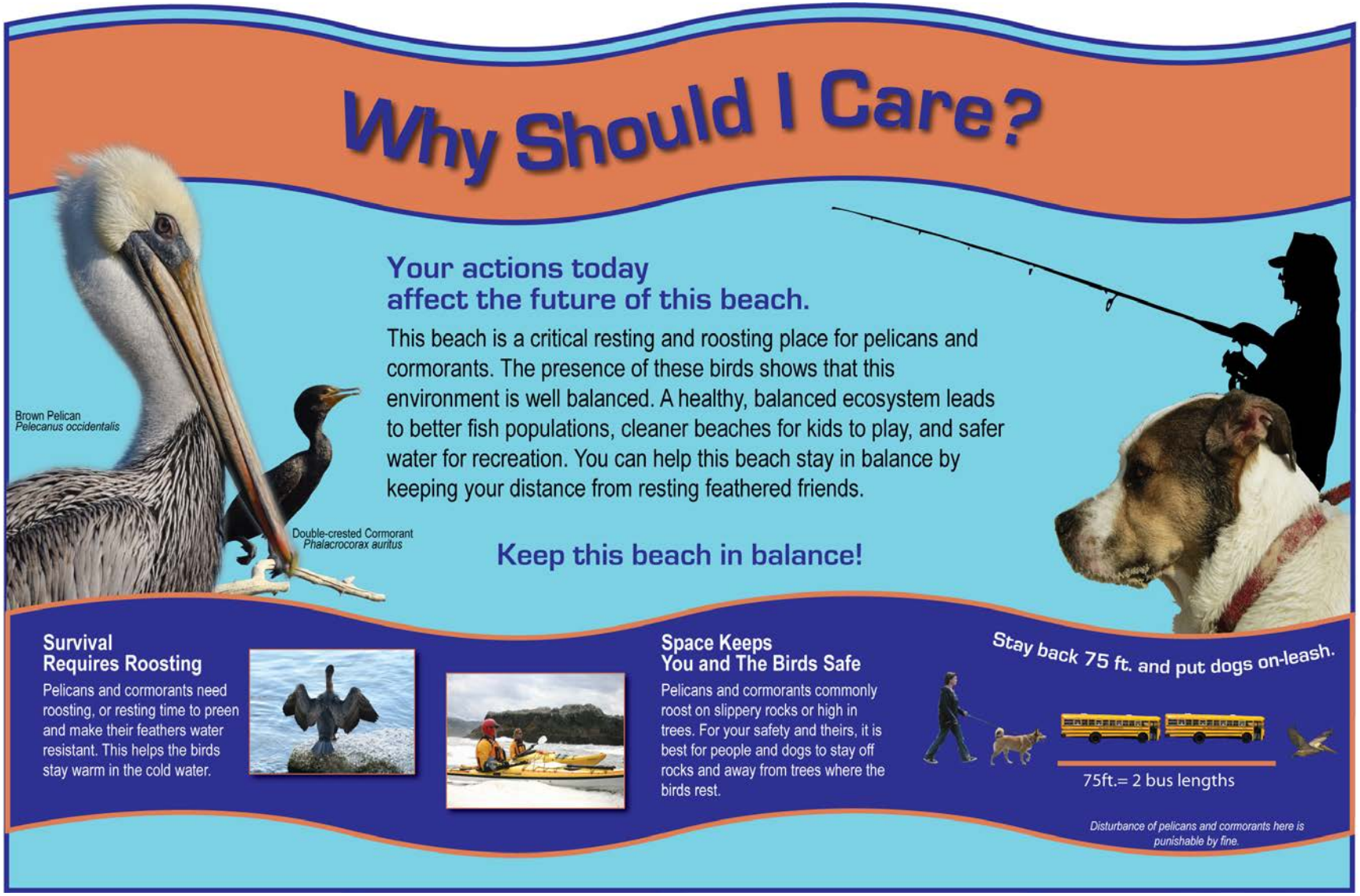
APPENDIX E- Pelican- Cormorant Project Roost Site Disturbance Form- Phase II

Site:	Date & Start Time:	End Time:	Weather & Tide Conditions:

Number of Pelicans present immediately before disturbance: Total: Adults: Juvenile: Unknown:			Number of Cormorants present immediately before disturbance: Total: Adults: Juvenile: Unknown:		
Number of visitors present during disturbance:			Describe presence of uniformed personnel, vehicles, and intervention:		
Time of Disturbance Start	Stop	*Source of Disturbance*	*Distance to Disturbance (ft)*	*Number of Birds Flushed (record number and species)* Departed	Relocated	Re-landed

Number of Pelicans present immediately before disturbance: Total: Adults: Juvenile: Unknown:			Number of Cormorants present immediately before disturbance: Total: Adults: Juvenile: Unknown:		
Number of visitors present during disturbance:			Describe presence of uniformed personnel, vehicles, and intervention:		
Time of Disturbance Start	Stop	*Source of Disturbance*	*Distance to Disturbance (ft)*	*Number of Birds Flushed (record number and species)* Departed	Relocated	Re-landed

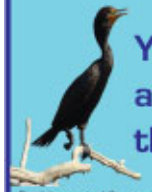
APPENDIX F- Pelican-Cormorant Sign Intervention



Pelican-Cormorant Brochure Intervention

Front

Why Should I Care?



Your actions today affect the future of this beach.

Double-crested Cormorant
Phalacrocorax auritus

This beach is a critical resting and roosting place for pelicans and cormorants. The presence of these birds shows that this environment is well balanced. A healthy, balanced ecosystem leads to better fish populations, cleaner beaches for kids to play, and safer water for recreation. You can help this beach stay in balance by keeping your distance from resting feathered friends.

Brown Pelican
Pelecanus occidentalis

Disturbance of pelicans and cormorants here is punishable by fine.

Back

Keep This Beach in Balance!

Survival Requires Roosting

Pelicans and cormorants need roosting or resting time to preen and make their feathers water resistant. This helps the birds stay warm in the cold water.

Space Keeps You and the Birds Safe

Pelicans and cormorants commonly roost on slippery rocks or high in trees. For your safety and theirs, it is best for people and dogs to stay away from rocks and trees where the birds rest.

Stay back 75 ft. and keep dogs on-leash.