

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

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## SECTION 1

### *Interpretation is an Effective Way of Controlling Visitor Behavior*

The field of interpretation has been in existence since the late 1800's during the days of Freeman Tilden and John Muir. Interpretation can be defined as the translation of the language of nature and science into information that a visitor or layperson can understand. Interpretation can be found in a sign at a campground, a ranger- led campfire program, a brochure- led trail, or a ranger staffed visitor center front desk.

Interpretation can be personal or non-personal. Both were used in this study. Personal interpretation involves a face-to-face interaction between an interpreter and a visitor, such as an interpreter talking with a visitor. Non-personal interpretation involves a visitor reading or listening to material such as a sign, brochure or audio recording.

Two of the primary subjects of this study, pelicans and cormorants, can commonly be observed along California's North Coast. They can be found soaring in the air, diving for fish, or roosting on shoreline rocks, pilings, and trees. Roosting, or resting, is important for pelicans and cormorants since they need time to let their feathers dry. If they don't take time to dry their feathers, the feathers stay wet and the birds develop hypothermia. So, roosting is necessary for the birds' survival.

The problem addressed in this study involves disturbances to the roosting behavior of pelicans and cormorants. Common disturbances observed on local beaches were boats approaching too close to the birds, dogs off leash getting too close, and people too close to the birds. Disturbances can cause pelicans and cormorants to flush, meaning they fly off and either re-land, re-locate, or depart completely.

There are two approaches to handling disturbances to the pelicans and cormorants – heavy-handed management and light-handed management. Heavy-handed management involves direct constraints on visitor behavior, such as restrictions on visitor use often supported by law enforcement. Light-handed management involves an indirect approach, such as interpretive messages, whereby visitors are informed and educated about the desired behavior. The latter approach is generally preferred by visitors seeking a recreational experience, as well as by managing agencies which rarely have the budgets and law enforcement personnel to effectively use the direct heavy-handed approach.

This study focuses on testing the effects of light-handed management. In Phase I of the study, baseline data was collected on the knowledge and attitudes of visitors and the number and type of human behaviors that led to bird disturbances. Then, three different interpretive interventions

were developed – a sign, a brochure, and a uniformed volunteer. In Phase II of the study, each intervention was tested at different times. With an intervention in place, data was collected on visitor knowledge and attitudes, and on human behaviors that led to bird disturbances. In an effort to triangulate data, three instruments were used to answer the primary research questions – written survey, oral interview, and surreptitious observation.

Every intervention that was tested – sign, brochure, and uniformed volunteer – was more effective than the control or baseline of no intervention. Overall, the number of disturbances observed by the researchers dropped from thirty four disturbances in Phase I to ten disturbances in Phase II.

Every intervention that was tested was more effective than no intervention (Table 1a). Positive human behaviors such as keeping distance from the birds, staying away from rocks, and staying away from the water all increased from Phase I to Phase II. Negative behaviors such as being out on rocks near the birds decreased from Phase I to Phase II.

**Table 1a. Comparison of behaviors with and without interventions in place, as observed by researcher. Desired behaviors are in bold. n=number of visitors**

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

The percentage of visitors who kept their dog on-leash increased from Phase I to Phase II (Table 1b). The percentage of visitors who allowed their dog to be off-leash decreased from Phase I to Phase II.

**Table 1b. Comparison of dog leashing behaviors with and without interventions in place, as observed by researcher. Desired behavior in bold. n=number of visitors**

	<b>Phase I (n=29)</b>	<b>Phase II (n=7)</b>
<b><i>Dog on-leash</i></b>	34.5%	57.1%
Dog off-leash	65.5%	42.9%

Collectively, this data shows that light-handed interpretive interventions can control visitor behavior better than no intervention at all.

## SECTION II

### Pros and Cons of Individual Interventions

#### ***Uniformed Volunteer***

The uniformed volunteer was one of three interventions tested in this study. The uniformed volunteer was dressed in a Bureau of Land Management (BLM) volunteer t-shirt and volunteer cap. When a visitor arrived on-site, the uniformed volunteer approached each visitor with the following message:

*“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.”*

Visitors who participated in the uniformed volunteer intervention showed the highest recall of the main message in subsequent surveys or interviews. 100% of visitors gave a correct response to the question asking for the main message they received about pelicans or cormorants.

One reason for the success of the uniformed volunteer intervention could be that the visitors participated in personal interpretation where someone directly interacts with them face-to-face. Visitors may like that a real person is on-site. In addition, each person who entered the site was approached and given the dialogue, so 100% of visitors received the message.

While the uniformed volunteer has been shown to be very successful, there are some drawbacks to using uniformed volunteers at a site. Uniformed volunteers require training and oversight to be effective, which means increased time and cost to the agency. In addition, they are not often on site all the time and may not be able to work when most needed.

### ***Sign***

The sign tested in this study was developed using best practices in the field of interpretation. Color was used to catch attention and the text was kept to a minimum. Pictures were used to help bring the sign to life. A broken border wave shape at the top of the sign added to the sign's appeal.

A total of 72 people visited the beach sites in the study while the sign was in place. The combined interview and observation data show that 53% of these visitors stopped to read the sign when it was in place, although only 42% read it before starting their beach activities (Table 2). The mean time spent reading the sign was 25 seconds. The minimum time was 3 seconds and the maximum time was 74 seconds. The actual time necessary to fully read the sign was 36 seconds. This means that visitors read over two thirds of the sign.

**Table 2. Sign Intervention**

<b>Response</b>	<b>Percent of Respondents (n=72)</b>
Appeared not to notice sign	31.9%
Noticed the sign but did not stop to read it	15.3%
Stopped to read sign before starting activities	41.7%
Stopped to read sign after completing activities	11.1%
Total	100.0%

Visitors who participated in the sign intervention showed the second highest recall of the main message in the sign in subsequent surveys or interviews. Only the uniformed volunteer intervention scored better.

There are numerous advantages of using a sign to convey information to visitors. A sign does not require an on-site person in order to communicate the targeted message and therefore is more cost effective per visitor contact. Signs also convey the specific targeted message exactly the way management wants and are always available to visitors. Well-designed signs are likely to capture people's attention and be effective.

The negative aspects of a sign are that it does take time, money and expertise to produce an effective sign. Poorly designed signs are probably ignored by visitors. Signs may be vandalized, although vandalism-resistant materials may reduce the effects. Signs eventually need to be replaced. Visitors can choose what they read or don't read, so they may not get the message that management intended. Still, the benefits of a well-designed sign typically outweigh the costs.

### ***Brochure***

The brochure was the final intervention tested in this study. The brochure was created with the same design, text, photos, and broken border as the sign. The brochure was a rack card – a brochure-sized heavyweight card with printing on the front and back. A rack card was selected because it would be sturdier in the windy, wet coastal locations that were being sampled.

A total of 106 people visited the beach sites in the study while the brochure intervention was in place. A total of 32% of these visitors read the brochure. This is fewer than the proportion of visitors who read the sign. For those who read the brochure while standing at the post where the brochures were located, the mean time spent reading the brochure was 21 seconds (Table 3). This is less time than visitors attended to the sign. However, the time it takes to read the brochure was 37 seconds, which means visitors, on average, read just over half of the brochure.

For those who took the brochure to read during their visit, the mean time reading increased to 33 seconds. This is greater than the sign reading time. This data suggests that the brochure does not have the attracting power that the sign has, but of those who actually pick up and read the brochure, they read more than the sign.

**Table 3. Brochure Intervention**

<b>Response</b>	<b>Percent of Respondents (n=106)</b>
Appeared not to notice brochure	54.7%
Noticed the brochure, but did not pick up or read	13.2%
Picked up brochure	19.8%
Read brochure at post before activities	21.7%
Read brochure during activities	2.8%
Read brochure at post after activities	7.5%
Took brochure with them when leaving	9.4%

Although the brochure was found (in subsequent surveys or interviews) to increase knowledge of the main message, it was the least effective of the three interventions in this regard. Compared to the sign and the uniformed volunteer, the people in the brochure intervention were least likely to correctly recall the main message.

One of the benefits of the brochure is portability. Visitors can take the brochure and read it while doing activities on-site or they can take the brochure with them and read it later. They can receive the brochure as they enter they site and they can take it home as a souvenir.

Negative aspects of brochures include the cost to create and reproduce them. Brochures have to be periodically re-stocked (an empty brochure rack sends a clear negative message to visitors that managers don't really care much about the site and don't visit the site very often), and they need to be protected from the weather. There is also the waste of those that are discarded and the litter from those that are just thrown on the ground (also often sending a negative message).



## SECTION III

### *Final Recommendations*

The data show that light-handed management is effective at changing knowledge and behavior. Every intervention tested in this study showed that visitors were learning more, and they were behaving better than when no intervention was in place. It is therefore recommended that agencies use interpretation as a way to influence knowledge and behavior.

Overall, the uniformed volunteer intervention was most effective at changing knowledge. This could be expected since the uniformed volunteer was a personal interaction with the visitor. Also, every visitor to a site was given the message by the uniformed volunteer, so 100% of the visitors were exposed to the message.

Uniformed volunteers can be a great option for a site if there is enough time and money to train, maintain, and oversee the volunteers. If that is not the case, however, the sign has been shown in this study to be the next most effective interpretive intervention.

The sign is recommended for those who can afford a one-time, upfront investment of time and money. Signs require little maintenance and can be in place for many years, but one will want to make sure to design a sign well so it will attract attention and convey information.

This study showed the brochure to be effective at changing knowledge and attitudes, but not as effective as the uniformed volunteer or sign. Brochures are most recommended for sites where message portability would be helpful, for example handing out a brochure at an entrance kiosk, or in situations where the message might change from one season to the next. In this study, people were observed walking up to the post and reading the front of the brochure while it was still in the brochure holder. Only those who took the brochure out of the holder could experience the full message. It is therefore recommended to use a brochure where portability is desired.

In conclusion, few studies document that interpretive interventions can work to modify negative visitor behavior. This study collected the empirical data needed to show the effectiveness of the interventions in altering visitor behavior regarding wildlife.

The results of this, as one of the few documented reviews of human-wildlife interaction and assessment of interventions to modify that behavior, can be used by many other places that have human-wildlife interactions. Critical human-wildlife interactions can be more effectively managed due to the investments made by the Trustee Council which will further the ability of managers to manage wild places where use cannot simply be restricted and light-handed techniques have to be implemented.

# *Additional Resources*

# Sign Tips and Recommendations

- 1. Develop a theme-** the main message you want to get across. Keep it short and simple. A catchy theme will grab a visitor's attention.
- 2. Research.** Gather the facts you will need to support your theme
- 3. Write text.** Keep it short. A sentence should have no more than fifteen words. The sign should have fewer than three hundred words. Use analogies and metaphors when you can. Define terms that visitors may not understand. The reading level of the text should not exceed an eighth grade level. Readability statistics can be found in Microsoft Word.
- 4. Find or take pictures.** Select pictures that illustrate your theme. A good picture is worth a thousand words.
- 5. Put it all together.** The use of color will draw attention to the sign. A broken border will also draw attention.
- 6. Approval of management.** Make sure you have approval of the text, pictures, and general concept before you finalize.
- 7. Find a fabricator.** Call and get estimates from different fabricators.
- 8. Submit sign for fabrication.** Depending on the fabricator and the size of the project, this can take between six to eight weeks and cost between six and eight hundred dollars. Also, consider if you need the fabricator to create installation materials or if you already have the pedestal, board, etc. that you need.
- 9. Install your sign at your site.** Make sure it follows Americans with Disabilities Act regulations.

# Sign Fabricators

Ecos Communications  
2975 Valmont Road, Suite 110  
Boulder, CO 80300  
[www.ecos.us](http://www.ecos.us)  
(303) 444-3267

EnviroSigns  
2700 Fulton Dr NW  
Canton, OH 44718  
[www.envirosigns.com](http://www.envirosigns.com)  
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(888) 492-5377

Fossil Graphics  
44 Jefryn Blvd.  
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(800) 244-9809

Grand Visuals  
7332 S Alton Way, Building 13,  
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iZone  
2526 Charter Oak Dr.  
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