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Grassroots Conservation: Volunteers Contribute to Threatened and Endangered Species Projects and Foster a Supportive Public

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Abstract: Educational programs for volunteers participating in threatened and endangered species conservation projects foster supportive attitudes in individuals who then become valuable advocates. We surveyed volunteers to assess the impact of the Tern and Plover Conservation Partnership's program. This program trains volunteers to protect Interior Least Terns and Piping Plovers nesting at sand and gravel mines, lakeshore housing

developments, and river sandbars. Volunteers increased their knowledge and appreciation of threatened and endangered species and conservation policy. They expressed interest in contributing to conservation policymaking and felt that they can make a difference in the recovery of legally protected species.

Introduction

Many Extension programs rely on volunteers to assist with project activities in ways that enhance program success. In fact, without volunteer assistance, many projects could not be undertaken. In order to make most effective use of volunteers, Extension programs often conduct volunteer education short-courses. These short-courses may include both subject matter training and hands-on-activities, components that help develop individuals supportive of the program who then become useful advocates for the program. Also, these individuals are more likely to be retained in the program and may recruit others to participate in the program (Snider, 1985, Hoover & Connor, 2001; Van Winkle, Busler, Bowman, & Manoogian, 2002; Smith, Dasher, & Klingborg, 2005).

Background

The Tern and Plover Conservation Partnership (Partnership), founded in 1999, works to protect the state and federally protected Interior Least Tern (*Sternula antillarum athalassos*) and state and federally threatened Piping Plover (*Charadrius melodus*) in Nebraska. The Partnership's efforts are based in the lower Platte, Loup, and Elkhorn river corridors. The Partnership cooperates with sand and gravel mining companies, lakeshore housing developments, local communities, state and federal agencies, conservationists, and others to implement protection, monitoring, conflict avoidance, and educational activities for the conservation of terns and plovers. More information about the Partnership is available at <http://ternandplover.unl.edu>.

Interior Least Terns and Piping Plovers are imperiled in Nebraska, and throughout their range, due to the loss and degradation of their nesting habitat, increased predation, and increased human caused disturbance at their nesting areas (Haig, 1992; Thompson et al., 1997; USFWS, 2002). Formerly, terns and plovers nested on midstream sandbars in the lower Platte, Loup, and Elkhorn rivers. As river water flow has changed due to human activities, the availability of this sandbar nesting habitat has been substantially reduced (Kirsch, 1992; Ziewitz, Sidle, & Dinan 1992; Jenkins, 1999; Parnham, 2007; Brown & Jorgensen, in review).

Consequently, it has become necessary for the birds to use alternative nesting habitat. Both species now commonly nest on sand spoil piles surrounding the lakes at sand and gravel mines. These mines are located on property adjacent to or close to the rivers. After the mines are taken out of production, they are often converted into lakeshore housing communities by real estate developers. The birds continue to use the expanses of sand for nesting at these communities (Brown, Jorgensen, & Rehme, in press).

These legally protected birds are a sensitive social and political issue in Nebraska due to their need for water and river habitat for nesting. These needs are often perceived to be in conflict with agricultural, recreational, private, and commercial interests (Jenkins, 1999; Peck, McLeod, Hewlett, & Lovvorn, 2004; NRC, 2005). Avoidance of conflicts with these interests is imperative for the conservation of terns and plovers, given that disturbance can lead to nest loss and mortality of adults, eggs, and young birds. The presence of these two legally protected species can delay mining and housing development activities, causing interrupted production and economic loss (Shogren et al., 1999; Jenkins, 1999; NRC, 2005).

The Partnership works to proactively mediate and mitigate these conflicts (Marcus, Dinan, Johnson, Blankenship, & Lackey, 2007). By working with the Partnership, business interests can avoid prosecutions, fines, and negative publicity resulting from violations of the federal Endangered Species Act and the state of

Nebraska's Non-Game and Endangered Species Conservation Act.

The Partnership established a volunteer Adopt-a-Colony program in 2000 to provide help with project activities and to engage local community members in threatened and endangered species management issues. Volunteers expand the Partnership's limited personnel resources to operate more effectively at tern and plover nesting areas. Volunteers interact with the public, monitor nesting areas, participate in research activities and outreach programs, and contribute in myriad other ways. Volunteers who increase their understanding of the birds, the sand and gravel mining industry, housing developments, river ecosystems, and threatened and endangered species issues become a supportive voice for grassroots conservation.

Methods

Every year, March-June, Adopt-a-Colony volunteers are recruited and trained to work with Interior Least Terns and Piping Plovers according to Partnership protocols. Four-hour long training sessions include units on tern and plover natural history and nesting biology; the lower Platte, Loup, and Elkhorn rivers; the sand and gravel mining industry; the housing development industry; monitoring techniques; and conflict avoidance. Also included is a Mining Safety and Health Administration (MSHA) approved mine safety unit (30 CFR Part 46, <<http://www.msha.gov>>). Volunteers complete mine site-specific training as necessary. Volunteer time commitments range from 1 day per month to several days per week.

We evaluated volunteer experiences with the Adopt-a-Colony program by asking them to complete a four-page survey (IRB# 2000-09-022). Survey questions addressed volunteers' knowledge and appreciation of terns and plovers, river ecosystems, the mining industry, and threatened and endangered species issues (Figures 1a-f). Volunteers were also asked for their opinions about the adequacy of their training, program content, and how the program could be improved.

In 2000 - 2002, all Adopt-a-Colony volunteers were asked to complete the survey. In 2003 - 2004, only new volunteers were asked to complete the survey. In 3 years, 2000, 2003, and 2004, all the survey respondents were "new" volunteers. In 2001 and 2002, "old" volunteers were asked to complete the survey along with "new" volunteers. Very few "old" volunteers completed the survey, and we did not include their responses in our analyses. Our results reflect the experience of the Adopt-a-Colony program on novice program volunteers. This simplified our statistical analyses by removing the potentially confounding factor of previous experience with our program and made our conclusions more robust. Some of the program participants volunteer with other organizations, so we were unable to control for the general level of volunteer experience of our participants.

Survey results were summarized according to the approved survey protocol (IRB# 2000-09-022). Data were analyzed using GraphPad Prism, version 3.02 (GraphPad Software, 2002), with statistical significance set at $P < 0.01$.

Results

Of the 177 surveys sent to volunteers, 81 surveys were completed and returned for analysis, yielding a response rate of 0.46. Our response rate may be low and our results statistically more significant ($P < 0.0001$ for all) than expected for several reasons. Due to a lack of Partnership personnel, non-respondents were not contacted and reminded to return their surveys. This sort of secondary contact would have increased the response rate. Volunteers who chose not to continue with the Adopt-a-Colony may not have returned their surveys due to lack of interest. The volunteers who did respond most likely have continued with the program (C. Thody, personal communication), consequently we expect that their surveys would be more positive in nature. It is these volunteers that the Partnership seeks out and works to retain (Miller, & Smith, 1982; Poor, 1999; Lindner,

Murphy, & Briers, 2001; Lindner & Wingenbach, 2002; Wiseman, 2003). Table 1 shows the survey response rate by year.

Table 1.
Volunteer Surveys by Year (2000 - 2004)

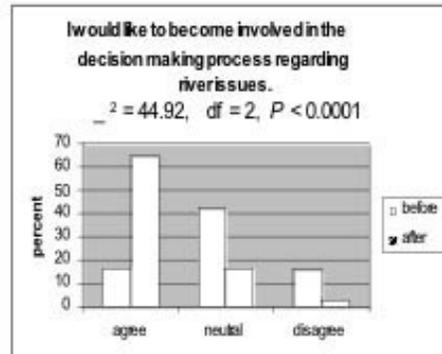
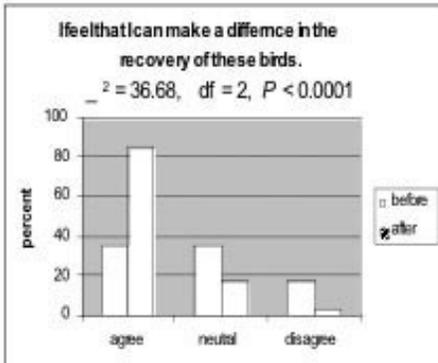
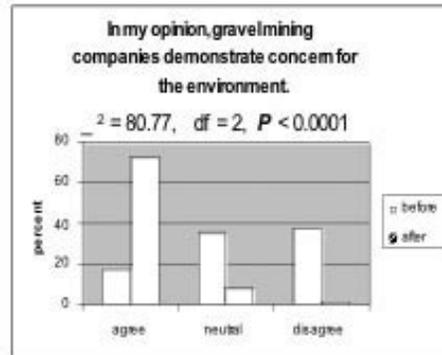
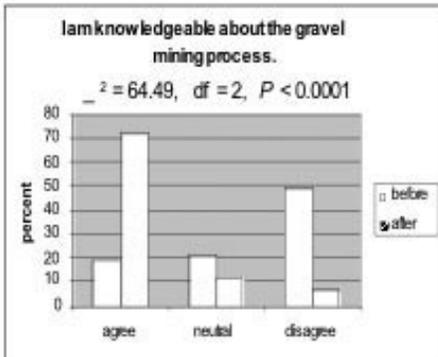
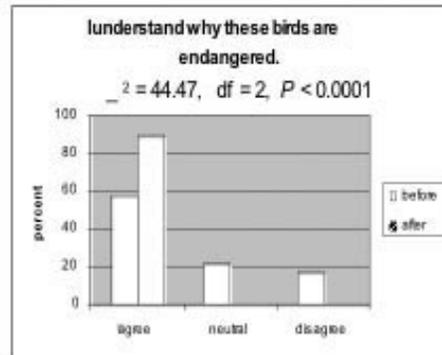
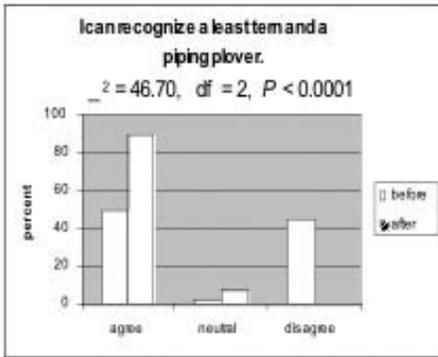
Year	# Sent	# Received	Rate
2000	69	32	0.46
2001	47	23	0.49
2002	16	13	0.81
2003	33	10	0.30
2004	12	3	0.25
Total	177	81	0.46

Of the survey respondents, 91% reported that participating in the Adopt-a-Colony program taught them a great deal about terns and plovers; 93% gained a greater appreciation of terns, plovers, and river ecosystems; 87% would likely participate in the program again; 89% were satisfied with their experience with the program; and 85 % would recommend the program to a friend.

The survey showed that participants, on average, told 12 people about the Adopt-a-Colony program. One participant wrote an article about the program for a local newspaper that had a circulation of 2,000 subscribers. Volunteers "spread the word" about the program to a much wider audience than could be done by Partnership personnel.

The survey included questions about the volunteers' attitudes *before* participating in the Adopt-a-Colony program and for comparison, what their attitudes were *after* participating in the program. Their responses to all six questions indicate a significant ($P < 0.0001$) increase in knowledge about terns and plovers, threatened and endangered species issues, and policy issues. Their responses also show a positive shift in attitudes toward these topics and a willingness to be involved in addressing these issues (Figs. 1a - f).

Figure 1.
Volunteer's Responses to Tern and Plover Conservation Partnership Survey Questions



Discussion

In both urban and rural areas, efforts to protect threatened and endangered species or to restore habitat for them are controversial. These efforts are often perceived to be in conflict with economic development, political policy, or other private issues (Shogren et al. 1999; Jenkins, 1999; Peck, McLeod, Hewlett, & Lovvorn, 2005). Consequently, many citizens develop negative attitudes toward the conservation of threatened or endangered species (Thigpen, 1995). These attitudes, when combined with a lack of understanding and appreciation of natural processes by the general public, hamper the recovery efforts of legally protected species.

Many conservationists have negative attitudes toward agricultural, industrial, political, or other economic development interests. These interests are often perceived as indifferent or detrimental to the environment (Jenkins, 1999; Murphy, 2003; Peck, McLeod, Hewlett, & Lovvorn, 2005). Sand and gravel mining and real estate development play important roles in the economies of riverside communities and the state of Nebraska

and will be present for the foreseeable future (USFWS, 2002, NRC, 2005). Tern and Plover Conservation Partnership outreach programs give recognition to companies that are conducting business in environmentally responsible ways and encourage other companies to do the same.

The goal of the Partnership and the Adopt-a-Colony program is to work proactively to mediate and mitigate conflicts between people carrying these disparate attitudes and the legally protected terns and plovers. Our survey results indicate that the Adopt-a-Colony training program is changing the attitudes of program volunteers and preparing them to work in their local communities on behalf of conservation. Trained, prepared volunteers are integral to the success of any conservation program. Partnership volunteers and outreach programs are creating an informed public with greater appreciation of and interest in conserving Interior Least Terns, Piping Plovers, and the river habitat they depend on. Partnership programs are also encouraging people and local communities to become engaged in the decision-making processes regarding conservation issues. Through our volunteer Adopt-a-Colony program we are increasing public understanding and support of grassroots conservation for terns and plovers and the lower Platte, Loup, and Elkhorn river corridors.

Following are some comments from our volunteers.

- "The staff gave me a better understanding about endangered species."
- "Now that I know more about these endangered species, I have a greater appreciation for them, and was happy to aid in their conservation."
- "I gained a greater appreciation for nature in general."
- "My co-workers became interested in what I was doing, so at times I was able to share information on the plight of the terns and plovers. Even in public when I wore the t-shirt, some people would ask me about the program."
- "I wrote a letter commenting on the Missouri River master manual in regard to managing river for terns and plovers."
- "A perception of how fragile a species is in relation to its environment and how vulnerable they are to our influence."
- "Thank you for the opportunity to help make a difference by doing what I enjoy doing."

What We Have Learned

- A satisfied volunteer becomes an Extension of your outreach program. Partnership volunteers "spread the word" about endangered and threatened species.

- Volunteers are most satisfied when they feel their work is making a difference. By working with the Partnership, volunteers know they are helping protect two imperiled species.
- Retention of volunteers is greatest when volunteers play a vital role in the program.
- A positive volunteer experience is a great tool for volunteer recruitment.
- Taking a personal interest in volunteers and their efforts will be rewarded.

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