

Recovery Plan Awareness Among South Florida Land-Use Decision-Makers

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Abstract

This study identified a challenge for natural resource communication: increasing awareness of species recovery plans among a key audience, local decision-makers. Under the Endangered Species Act, recovery plans are written to conserve threatened and endangered species and their ecosystems. For these plans to be successful, they must be integrated into local land-use decisions. A survey of land-use planners and regulators (N = 59) in the 19 counties of south Florida examined 1) exposure to information about threatened and endangered species, 2) awareness of the South Florida Multi-species Recovery Plan (MSRP), and 3) awareness of local threatened and endangered species. The results indicated decision-makers are receiving relatively little information about threatened and endangered species, have low awareness of the MSRP, and are only moderately aware of which threatened and endangered species occur in their counties. There is a need for better communication with local land-use decision-makers to increase awareness of recovery plans, the information they contain, and how to access them. Decision-makers also reported being pressed for time, needing information that pertains specifically to their county, and having concerns about the quality of the available information. Recommendations for message strategy include developing condensed versions of the plan, organizing information by county, and providing information to help decision-makers evaluate the utility and limitations of recovery plan information and make appropriate interpretations. Future research should examine how best to communicate with decision-makers in the context of recovery planning and other agricultural and natural resources issues.

Introduction

Past research has defined the goal of environmental education as developing environmentally responsible and active citizens (Hines, Hungerford, & Tomera, 1986). In addition to the general public, however,

decision-makers in government agencies are an important audience for messages about the environment and natural resources. Decision-makers may be an increasingly significant audience; Richardson, Clement, and Mustian (1997) cited Extension's growing involvement in public policy, particularly in the area of natural resources. Relatively little research, however, has focused on targeting government decision-makers. Rodriguez, Farnall, Gesks, and Peterson (1998) included state legislators in their study of attitudes towards natural resources, but they did not explicitly focus on this group's opinions. Richardson and his colleagues examined county-level government employees as a nontraditional audience for Extension and found that they did not rely on Extension information and preferred to receive information in printed form. Boone, Tucker, and McClaskey (2002) evaluated the effectiveness of United States Department of Agriculture (USDA) Impact Fact Sheets in communicating with congressional aides. They found less than half of the aides had seen or used the fact sheets. These findings indicate government decision-makers represent a distinct audience that has unique information needs and may be a particularly challenging target for communication. The findings also suggest additional research is needed to better understand this segment.

Recovery Plans: A Communications Challenge

The U.S. Endangered Species Act (ESA, 1973) calls for protection of federally listed threatened and endangered species and charges the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) with developing recovery plans for these species. The ultimate success of both the ESA and recovery planning has been called into question because of the limited number of species that have been recovered (Foin, Riley, Paley, & Anitra, 1998; Tear, Scott, Hayward, & Griffith, 1993), and scholars have identified many potential obstacles to the success of these plans, including social factors such as communication. Michaelidou, Decker, and Lassoie (2002) presented a general model of recovery viability that identified both ecosystem and community factors as well as external social, economic, and political forces. Communication with the general public during the writing and implementation of a recovery plan has been cited as critical to long-term success (Tear, Scott, Hayward, & Griffith, 1995). Another key point for communication, however, may be between the agencies that produce the recovery plans and local government officials who make decisions concerning land-use planning and regulation.

Target: Local Decision-Makers

Lack of communication with local government officials could be a significant obstacle to species recovery. As Schemske, Husband, Ruckelshaus, Goodwillie, Parker, and Bishop state, "Communication among land managers at all levels of government is another challenge to species recovery. Inter-action is crucial among the diverse federal and local agencies charged with the responsibility of implementing recovery guidelines . . ." (1994, p. 599). Research examining species protection has tended to focus on decision-making at the federal or state level, while little work has focused on the local level (Press, Doak, & Steinberg, 1996). Local level decisions may be especially relevant for recovery because research has shown many species' habitat is restricted to a narrow range that often corresponds to the county-level in scale (Schemske et al., Press et al.). As Press and his colleagues state, "because of past habitat destruction or natural endemism, most endangered species, especially plants, occur at far smaller spatial scales than do the most charismatic endangered fauna" (p. 1539).

South Florida Multi-Species Recovery Plan

Local awareness and knowledge of recovery plans would be expected to play an important role in species recovery across the United States; however, south Florida was selected as the location for this study. In south Florida, considerable loss of habitat due to development has threatened animal and plant species, and the federal government has sought to address this problem, in part, through a multi-species recovery plan. The problems of south Florida may be particularly relevant to the rest of the country, since habitat loss has been identified as a primary threat to species nationally (Czech, Krausman, & Devers, 2000; Wilcove, Rothstein, & Dubow, 1998; Foin et al., 1998), specifically through land-use conversion that alters habitat (Tear et al., 1995).

The federal government produced the South Florida Ecosystem Restoration Initiative in 1993 with three major objectives: 1) to restore and maintain the biodiversity of native plants and animals in the south Florida ecosystem; 2) to recover species that are threatened or endangered; and 3) to ensure that any development plans or permits for development are fully coordinated among affected governmental agencies and are compatible with the restoration of the south Florida ecosystem. Under the authority of the ESA, the U.S. Fish and Wildlife Service completed the South Florida Multi-species Recovery Plan (MSRP) to address the first two objectives. The MSRP uses an ecosystem-wide approach, and identifies the recovery and restoration needs of threatened and endangered species along with their habitats in the south Florida ecosystem (U.S. Fish and Wildlife Service, 1999). To

achieve the third objective, local land-use planners and regulators must use the MSRP in decision-making. Land-use planners project and design changes in how land is used to meet societal needs in response to population growth, while regulators review proposals for specific land-use changes.

Land-use decisions in Florida are accomplished at the regional level by Regional Planning Councils and at the local level by county and municipal governments. While regional and local planners and regulators are, in all likelihood, willing to participate in the Restoration Initiative, they may not be actively seeking scientific input into their decision-making process (Ogden, 1999), and they may not be aware of documents such as the MSRP. Even if they are aware of these documents, scientific information may not currently exist in a readily accessible format. The MSRP is available online as well as in CD and paper formats; however, this document is more than two thousand pages, and local planners and regulators often operate with limited time and resources (Mazzotti, 1999).

Purpose

The purpose of this study was to examine land-use decision-makers' awareness of the MSRP, their awareness of the species the MSRP is designed to recover, and their exposure to information about threatened and endangered species. Low levels of awareness and information exposure among these key decision-makers would pose a significant obstacle to successful species recovery. The specific research questions were as follows:

RQ1: How much information have land-use decision-makers been exposed to regarding threatened and endangered species, and from what sources?

RQ2: What is their awareness and usage of the MSRP?

RQ3: What is their awareness of threatened and endangered species?

Method

A questionnaire (N = 59) was administered to employees in offices relating to land-use planning or regulation in the nineteen counties of south Florida¹. The names and structure of these offices are not uniform, so county Web sites and phone calls were used to identify relevant offices and personnel in these offices. All employees of land-use planning and regulation offices were included in the sample, including both senior-level personnel and staff members, which yielded a population of 207. (Although the goal was to compile a complete list of employees, some counties may not have

listed all employees, and Web sites may not have been completely up-to-date). A mixed-mode survey design (Dillman, 2000) was used with mail surveys followed by telephone surveys. Past studies of personnel in government (Church, 2001; Morash & Robinson, 2001) and private organizations (Kossek, Roberts, Fisher, & Demarr, 1998) have combined mail and phone methods and reported minimal differences in results. Mail, the less expensive method, was used first, followed by the more expensive method of telephone (Dillman). The telephone interviews were conducted by a trained research assistant.

Surveys were sent to the entire population (207), and 32 were returned within six weeks for a first-wave response rate of 16%. The entire list of 207 employees was then called, and the survey was administered by telephone to those who had not responded previously. Twenty-seven surveys were completed by phone, with a response rate of 15% (27 of 175). Fourteen respondents refused to answer the telephone survey; remaining calls were not completed because the individual was out of the office, the call was to a disconnected number, or the individual did not feel qualified to answer the survey and referred the caller to another number. Overall response rate was 29%.

Many of the survey questions were presented in an open-ended format to best gauge awareness and attitudes in this exploratory phase of research. Questions assessed exposure to threatened and endangered species information from five sources (adapted from Corbett, 2002), respondents' own effort to seek this information (adapted from Corbett, 2002), and the biggest obstacle to seeking threatened and endangered species information. Questions focusing on the MSRP assessed whether respondents had heard of the document and how, awareness of what information was presented in the MSRP, and the number of times this information would have been applicable for them. Respondents were also asked whether they had ever referred to the MSRP and how they had used it, and how the MSRP could be made more useful for them. (The questions concerning the MSRP were developed specifically for this study). Finally, subjects were asked to identify threatened and endangered species in their county (adapted from Jacobson & Marynowski, 1997). Four open-ended questions required categorization of responses. Two trained coders categorized these responses, and inter-coder reliability was 94.2 (Hocking, Stacks, & McDermott, 2003).

Findings

Sixty percent of the respondents were male, and 40% percent were female. Their ages ranged from 26 to 60 with a mean age of 45. The respondents represented 14 of the 19 south Florida counties². Almost half of

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respondents (47%) reported they worked in a department devoted to planning and identified their position as “planner” (46%). Others worked in development departments (14%) and departments including growth management, environmental resource management, biological resources, and solid waste departments. Respondents’ average number of years in their current position was 6.3, with a range from 1 to 23 years.

Information Exposure

Respondents were asked how much threatened and endangered species information they had heard lately from five sources: the media, nonprofit organizations, state government, the federal government, and specifically the U.S. Fish and Wildlife Service (adapted from Corbett, 2002). The means for all sources were relatively low. The mean for nonprofit organizations was significantly greater than the other sources at alpha of .05; there were no statistical differences among the other means (see Table 1). Respondents were also asked how much effort they had made in the last 12 months to look for information on threatened or endangered species in their region on a scale ranging from “absolutely none” to “a great deal,” (adapted from Corbett, 2002) and the mean was below the scale mid-point ($M = 2.69$, $SD = 1.30$).

Table 1. *Threatened and Endangered Species Information Exposure*

Information source	Mean	Standard deviation
Nonprofit organizations	3.00*	1.17
Media	2.53	1.06
U.S. Fish and Wildlife Service	2.47	1.19
State government	2.47	1.04
Federal government	2.34	1.17

Note: Information exposure was rated on 5-point scales (1 = absolutely none, 5 = a great deal).

*The mean for nonprofit organizations was greater than the other means at $p < .05$.

In an open-ended question, subjects were asked to identify the biggest obstacle to their seeking information about threatened and endangered species in their region. Examination of the responses indicated there were three main categories of obstacles: problems with the information, lack of time, and not knowing where to look or who to contact. (See Table 2).

MSRP Awareness and Usage

When asked whether they had heard of the MSRP, most respondents answered no ($n = 34$, 58%), while 25 (42%) answered yes. Respondents

Table 2. *Biggest Obstacle Reported for Seeking Information About Threatened and Endangered Species*

Obstacle listed	Number of respondents	Examples
Problems with information	17 (29%)	Not enough information; information not specific enough at local level; not accurate/up-to-date, conflicting, not synthesized in a central location
Lack of time	16 (27%)	Time required to locate information, lack of time to make it a priority given other commitments
Not knowing where to look/	13 (22%)	Not knowing what agency or who to contact, where to find appropriate Web site
Lack of personal relevance/interest	3 (5%)	
Don't know of an obstacle	3 (5%)	
Other	3 (5%)	
Blank	4 (7%)	

Note: Subjects reported the biggest obstacle they faced in an open-ended question.

answering yes were asked to write in how they had heard about the MSRP. The most common answers were through one's colleagues or job (6 respondents, 24%) or through personally having a copy of the MSRP (6 respondents, 24%). Four respondents (16%) cited the U.S. Fish and Wildlife Service as the information source: two of these specified a notice and one of the four specified a meeting. Two subjects (8%) listed a conference as the source of information, two (8%) indicated they did not remember or were not sure, three listed some other source, and two respondents who indicated they had heard of the MSRP did not list the information source.

Awareness of the contents of the MSRP was also low. Respondents rated their awareness that the MSRP contained information about five topics on a five-point scale ranging from "not at all aware" to "very much aware." Awareness was significantly higher that the MSRP contained information about threatened and endangered animal and plant species than restoration goals for these species, habitat requirements for these species, and ecological communities of south Florida (see Table 3). As a secondary measure of awareness of the MSRP, subjects were asked how many times they had been involved in a decision-making process in which the information in the

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MSRP would have been applicable. Respondents either filled in the number of times or indicated “don’t know.” Most subjects replied “don’t know,” (n = 38, 64%). Six subjects (10%) estimated there were zero times in which the information in the MSRP would have been applicable for them. The remaining 15 responses ranged from 2 to 24, with two subjects indicating there were too many instances to count.

Table 3. *Awareness of the Information Presented in the MSRP*

Information	Mean	Standard deviation
Threatened and endangered animal species	2.36a	1.73
Threatened and endangered plant species	2.33a	1.74
Species restoration goals	2.24b	1.64
Species habitat requirements	2.23b	1.64
Ecological communities of south Florida	2.12b	1.58

Note: Awareness was rated on a 5-point scales (1 = not at all aware, 5 = very much aware). Means with different subscripts differ significantly at $p < .05$.

Actual usage of the MSRP was also assessed. Respondents were asked if they had ever referred to the MSRP, and most answered no (n = 47, 80%). One subject left the question blank, and the remaining 11 (19%) answered yes. Subjects who answered yes were asked how often they had referred to the MSRP and to describe how they had used it. Only 6 of the 11 specified how often they referred to the MSRP, with answers ranging from infrequently to at least once a week. All 11 described how they had used the MSRP. Three subjects indicated using it in land-development regulation decisions and application review; as one respondent wrote, “When development is reviewed and a species is found on site I will check to see if they are meeting suggested methodology for the species.” Two indicated using the MSRP to find information about specific species, including the eagle, scrub jay, and manatee. Two had used the MSRP in writing grant proposals, and two had used it in developing education materials, such as brochures, for the public. One of these respondents stated:

I took the pages of the communities and species that can be found in _____ County and made a smaller notebook that I put at the front counter where we deal with the ‘public.’ I use it a lot when I need to explain to the public why we do Environmental Clearance on their property. And occasionally we use it with other staff.

The two remaining respondents indicated some other use.

Last, an open-ended question asked subjects how the MSRP could be made more useful for them. The most common response was don't know or need more information ($n = 16, 27\%$). Fifteen respondents (25%) recommended greater communication and/or distribution of the MSRP. One of these respondents stated, "Get the word out about the plan," while another said it should be "placed on the Internet and publicized by media." Two of the 15 respondents specifically mentioned target audiences; these were the local governments and county / regional planning organizations. Four subjects (7%) recommended condensing the plan for easier reference. Two of these specifically mentioned organizing the information based on location. Thirteen subjects left this question blank, and 11 provided some other type of recommendation.

Awareness of Threatened and Endangered Species

Knowledge of specific threatened and endangered species was assessed with a format used by Jacobson and Marynowski (1997). Threatened and endangered species identified in the MSRP as having habitat in all of the 19 counties of south Florida were listed, and respondents were asked 1) whether or not the species lives in their county, and 2) whether or not it is threatened or endangered. "Don't know" was also included as a possible response. The list did not include mammals or plants, because none are identified by the MSRP as occurring in all of the south Florida counties. Five birds were listed (Audubon's crested caracara, Bald eagle, Florida scrub-jay, Everglade snail kite, and Piping plover) and four reptiles (Eastern indigo snake, Green sea turtle, Hawksbill sea turtle, and Kemp's ridley sea turtle). More than 50% of respondents identified all the listed reptiles as threatened or endangered and occurring in their county, although roughly one third answered "no" to each of these questions (see Table 4). More than half of respondents also identified three of the five bird species (Bald eagle, Florida scrub-jay, Everglade snail kite) as threatened or endangered and occurring in their county. Awareness was lowest for the Everglade snail kite, with the combined "no" and "don't know" responses making up over 40% of the answers to both questions. For the two remaining bird species, however (Audubon's crested caracara and Piping plover), awareness was even lower, with most respondents indicating these species were not threatened or endangered and did not occur in their county.

Discussion

This study identified an important challenge for natural resources communication: generating awareness among local decision-makers about

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Table 4. *Awareness of Threatened and Endangered Species*

Species	Lives in your county			Is threatened or endangered		
	Yes	No	Don't know	Yes	No	Don't know
Reptiles						
Eastern indigo snake	45 (76%)	13 (22%)	1 (2%)	35 (59%)	19 (32%)	5 (8%)
Green sea turtle	39 (66%)	16 (27%)	4 (7%)	37 (63%)	22 (37%)	0
Hawksbill sea turtle	35 (59%)	19 (32%)	5 (8)	34 (58%)	25 (42%)	0
Kemp's ridley sea turtle	30 (51%)	23 (39%)	6 (10%)	33 (56%)	26 (44%)	0
Birds						
Audubon's crested caracara	18 (31%)	37 (63%)	4 (7%)	18 (31%)	40 (68%)	1 (2%)
Bald eagle	48 (81%)	6 (10%)	5 (8%)	49 (83%)	8 (14%)	2 (3%)
Florida scrub-jay	43 (73%)	11 (19%)	5 (8%)	42 (71%)	13 (22%)	4 (7%)
Everglade snail kite	30 (51%)	23 (39%)	6 (10%)	33 (56%)	26 (44%)	0
Piping plover	19 (32%)	35 (59%)	5 (8%)	17 (29%)	42 (71%)	0

Note: All species have habitat in the respondents' counties and are threatened or endangered.

recovery plans and the information they present. The ESA calls for the USFWS and NMFS to conserve threatened and endangered species, create recovery plans, and take necessary steps to achieve this goal. These necessary steps may include additional communication activities that increase awareness of recovery plans among individuals whose decisions have a major impact on habitat. It was found that county land-use decision-makers in south Florida are receiving relatively little information about threatened and endangered species, have low awareness of the South Florida Multi-species Recovery Plan, and were only moderately aware of which threatened and endangered species occurred in their counties. These findings highlight the need for communication research that focuses on a relatively understudied target audience: government decision-makers.

Decision-makers in this study reported receiving little information about threatened and endangered species from the government, media, and non-profit organizations. The most information was received from nonprofits;

however, this mean was only at the scale mid-point. Additionally, a number of respondents reported not knowing where to look for threatened and endangered species information. The MSRP is available online; however, many respondents were unaware of this and requested it be posted online. The majority of respondents had never heard of the MSRP and had never used it, and awareness of the types of information it contains was also low. Respondents were most aware the MSRP contains information about threatened and endangered animal and plant species, which could likely be surmised from the document's title, and even this mean was below the scale mid-point. A further indication of low awareness was that most respondents did not know how many times the MSRP would have been applicable to their work. The majority of respondents were able to identify all but two species of birds as threatened or endangered species in their counties; however, there was a great deal of variability, with many respondents indicating species were not threatened or endangered and did not occur in their county. While awareness of species is important for land-use decision-makers, the MSRP contains additional information about habitat needs and an ecosystem-wide approach to recovery. There was low awareness that the MSRP contained information about restoration, habitat requirements, and ecological communities.

The study findings indicate there is a need for better communication with local land-use decision-makers that will increase awareness of recovery plans, the information they contain, and how to access them. Boone and her colleagues (2002) examined the effectiveness of information aimed at government officials and found, similar to the results of this study, that most officials had never referred to the messages. Future research should examine how best to reach decision-makers and challenge assumptions that decision-makers are aware of and using information simply because it has been distributed in hard copy or posted on the Internet. The findings of this study also provide the basis for developing message strategy for these communications. Based on this study, it seems future messages should 1) include condensed versions of the recovery plan, 2) organize information by county, and 3) address decision-makers' concerns about the quality of the information.

It is important to condense recovery plans, which can be thousands of pages long, so the information is more readily accessible to decision-makers. Respondents in this study reported making relatively little effort to seek out information about threatened and endangered species, and one of the major obstacles to seeking information was lack of time. Four subjects specifically mentioned the MSRP could be improved by condensing the plan for easier reference. Decision-makers may be an especially time-pressed audience because this target is defined based on employment and must be reached at

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work rather than during leisure time. Richardson and his colleagues (1997) found that county government employees preferred to receive information in paper format, and they suggested this was because paper provided the most control in accessing information. Control and manageability could be further enhanced by distributing a condensed version of the recovery plan in addition to an electronic link or hard copy of the complete document.

A second strategy recommendation is for county-level information to be easily accessible. It is certainly important for recovery plans to be inclusive in the design stage, encompassing the entire affected region and all species and habitat targeted for recovery or restoration. When decision-makers are acting, however, they need information that is specific to their county. One reported obstacle to seeking threatened and endangered species information was that information is generally not specific enough at the local level, and one respondent described using the MSRP to create a smaller notebook with only the species and ecological systems that occurred in that county. When asked for suggestions on how to improve the MSRP, two subjects specifically mentioned organizing the information based on location. A condensed document, tailored for each individual county, would satisfy the goals of condensing and localizing information. Additionally, it would be beneficial to provide an index and/or search engine that provides a simple means of searching the entire paper or electronic document by county.

Third, communications should address decision-makers' concerns about the quality of information about threatened and endangered species. Problems with information were one of the major obstacles to information seeking, and respondents cited issues such as conflicting information, information that was not accurate or up-to-date, information that was not specific enough at the local level, and not having enough information. Further research is necessary to better understand decision-makers' concerns, but it seems important for messages to clearly explain both the utility and limitations of recovery plan information and to aid decision-makers in making appropriate interpretations of the data. Scholars have also critiqued the quality of available information, so it seems important to include decision-makers in discussions of the pros and cons of using the available data.

A potential limitation of the study was the overall response rate. An important issue in considering the effects of response rate is nonresponse error, or the likelihood that people who did not respond to the survey differed from those who did in ways that are relevant for the study (Dillman, 2000). The purpose of this study was to assess recovery plan awareness among land-use planners and regulators. It seems likely that nonrespondents may have had even lower levels of awareness than respondents. This

difference, however, would only strengthen the conclusion that awareness levels are quite low and that communication is needed. One explanation for the relatively low response rate is coverage error in terms of including people who were not in the study population (Dillman). There was no existing sample list, so it was necessary to compile this information based on county Web sites, which may have included people who no longer worked for the agency. Additionally, because there was no existing list of land-use planners and regulators, and because these activities are housed in different offices depending on the county, the sampling frame included all employees in offices relating to land-use planning and regulations. In all likelihood, this frame included people whose jobs were not directly related to land-use planning and regulation or the information in the South Florida Multi-species Recovery Plan, and these people would not be expected to respond to the survey.

Further research is necessary to examine how each of the recommended strategies could be effectively employed. Future studies could also examine communication needs for recovery plans in other parts of the country, as well as different communication contexts in which decision-makers are a relevant target audience. An agenda for this research could include examining how to present information to decision-makers in formats that are attention-getting, easily accessible, and clear about the role and purpose of the information. A greater understanding of how to effectively communicate with decision-makers could aid in accomplishing the goals of the ESA as well as many other goals of agricultural and natural resources communication.

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Keywords:

land-use planning, recovery planning, threatened and endangered species

End Notes

¹These are Broward, Charlotte, Collier, DeSoto, Glades, Hardee, Hendry, Highlands, Indian River, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, Sarasota, and St. Lucie.

²Okeechobee, Glades, Hardee, Polk, and Sarasota Counties were not represented. No surveys were sent to Okeechobee, a small county in which no offices relating to land-use planning or regulation were identified (these tasks were contracted out). Glades and Hardee have the smallest populations among the south Florida counties (one survey was sent to Glades and four to Hardee). Although Polk and Sarasota are relatively large counties, only two and three employees, respectively, were identified as working in land-use planning and regulation.

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