

Forest Service Grazing Permittee Perceptions of the Endangered Species Act in Southeastern Arizona

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Abstract

This study reports the results of a survey of Coronado National Forest grazing permittees about their attitudes regarding the Endangered Species Act (ESA) and the management of threatened and endangered (T&E) species on grazing allotments in southeastern Arizona. A majority of respondents perceived negative impacts from ESA implementation. However, the degree of impact remained independent of the number of listed species on allotments and of the potential for restrictions on those allotments. Perceptions of negative impact and attitudes toward T&E species policies were more related to attitudes toward federal regulation. Permittees broadly supported the idea of species conservation and expressed willingness to work with federal agencies but did not perceive the federal agencies as having the same responsiveness to their concerns. A more proactive agency strategy with science-based, focused recovery objectives coupled with economic incentives could improve support for species recovery efforts.

Resumen

Este estudio presenta los resultados de una encuesta a los usuarios que pastorean en el Bosque Nacional Coronado acerca de sus actitudes con respecto a la Ley de Especies en peligro (ESA, en inglés) y la administración de especies amenazadas y en peligro (T&E, en inglés) en áreas de pastoreo en el Sudeste de Arizona. Una mayoría de las personas que respondieron, percibieron impactos negativos de la implementación de la ESA. Sin embargo, el grado del impacto fue independiente del número especies en la lista de peligro, en las áreas de pastoreo y el potencial para restricciones en las mismas. Las percepciones del impacto y actitudes negativas hacia las políticas de T&E estuvieron más relacionadas a actitudes hacia la regulación federal. Los usuarios apoyaron ampliamente la idea de la conservación de especies y expresaron su deseo de trabajar con agencias federales, pero consideran que las agencias federales no tienen la misma receptividad a sus preocupaciones. Una estrategia más pro-activa de la agencia, con objetivos basados en ciencia, y enfocados en objetivos de recuperación, acompañados de incentivos económicos podría mejorar apoyo para esfuerzos de recuperación de especies.

Key Words: attitudes, Coronado National Forest, public land grazing, survey

INTRODUCTION

Few pieces of federal legislation related to natural resources management have sparked as much controversy as the Endangered Species Act (ESA) of 1973 (16 USC § 1531–1534 [2001]). Eluding reauthorization since its expiration in 1992, the act continues to be the subject of fierce debates in Congress, the courts, academia, and the press.

A large number of the conflicts over threatened and endangered (T&E) species in the Southwest have centered on the presence and management of public land livestock grazing. A handful of broad-reaching lawsuits have sought to halt grazing on every national forest in the Southwest (*Southwest Center for*

Biological Diversity [SWCBD] and Forest Guardians [FG] v. Forest Service [FS], NM and AZ Cattlegrowers Associations, intervenors, no. CV-97-666 TUC JMR; CBD and FG v. FS, no. CV-01-2009 PHX JWS). The suits assert primarily that federal agencies have failed to meet the procedural requirements of the ESA and thus have potentially harmed T&E species.

Livestock grazing permittees in the Southwest have become increasingly concerned about the future of their grazing operations, most of which depend on access to public lands forage. Several studies have sought to better understand ranchers' perspectives on T&E species regulation, but the emphasis has been on private ranchlands, such as in Texas (Peterson and Horton 1995; Weeks and Packard 1997). Two policy studies inquire more generally about the potential impacts of losses of animal unit months (AUMs) due to environmental policy (Gentner 1998; Rowe et al. 2001), but research specifically on permittees' attitudes toward implementation of section 7 of the act is nonexistent.

Permittees' attitudes may play an important part in determining how T&E species' habitats will be managed. In

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Arizona, approximately 76% of the land area (excluding tribal lands) is owned by either the federal government or the state (Ruyle et al. 2000), and 72% of these federal and state lands are actively grazed by livestock (as calculated from Ruyle 1991; Ruyle et al. 2000). Given this context, permittees have a significant direct influence on the fate of T&E species' habitats and will continue to do so as long as grazing permits are issued.

This study seeks to understand how livestock permittees on 1 national forest perceive the ESA and its effects on their operations. Before presenting our methods and results, we first briefly review the application of the ESA to public land grazing allotments to provide the context for our study. Although limited to the scope of a single Southwest forest, this study will inform the debate on public lands grazing and contribute to improved understanding of the management of T&E species habitat on public land grazing allotments.

OVERVIEW OF THE ESA

The purpose of the ESA is to provide "a means whereby the ecosystems upon which [endangered species] depend may be conserved" (16 USC § 1531[b][2001]). The act enlists all federal departments and agencies in its task, ordering them to "conserve endangered species and threatened species and . . . utilize their authorities in furtherance of the purposes of this [act]" (16 USC § 1531[c][2001]). Species gain protective status through the listing procedures of Section 4 of the Act (Doremus 1997). Once a species is listed, the prohibitions of sections 7 and 9 constrain the actions of government agencies and private individuals. Section 7 prohibits government actions that would result in jeopardy to a listed species, and section 9 prohibits the taking of any listed species. Section 11 provides for penalties and enforcement, including citizen lawsuits (Bean and Rowland 1997).

Section 7, the focus of much of the ESA litigation (Yaffee 1982; Cheever 1996), requires that each federal agency ensure that the actions it authorizes, funds, or implements do not jeopardize the continued existence of any federally listed species and prohibits the destruction or adverse modification of critical habitat (16 USC § 1536[a][2][2001]). Government agencies wishing to undertake almost any kind of project must first complete an interagency consultation process with the US Fish and Wildlife Service (FWS). If T&E species or their critical habitats are found to be present, then the agency proposing the project is required to conduct a biological assessment (BA) to determine whether or not the activity as proposed is likely to adversely affect these species or their critical habitat (50 CFR 402.02 [2001]). This process may determine potential adverse effects on a listed species, and modifications to the initial proposal may be necessary. The agency may need to consult informally with the FWS to identify ways to eliminate any residual adverse effects. If this effort is successful, the FWS will concur in writing that the revised action is not likely to adversely affect the listed species or its designated critical habitat (50 CFR 402.02, 402.14 [2001]). If in informal consultation residual effects cannot be eliminated and it is determined that an agency's actions are likely to adversely affect a listed species or adversely modify its critical habitat, then formal consultation is required. This process begins with

the agency's written request and submittal of an initiation package and concludes with the issuance of a biological opinion (BO) and incidental take statement by the FWS along with the described reasonable and prudent alternative measures (50 CFR 402.2, 402.13-1 [2001]).

Livestock grazing on federal grazing allotments constitutes an agency action subject to the prohibitions of sections 7 and 9 of the ESA. These actions include the initial authorization and issuance of a grazing permit; permit renewal, which generally occurs every 10 years; and ongoing grazing activity, which is updated yearly through annual operating instructions.

STUDY AREA

The Coronado National Forest (CNF) in southeastern Arizona provided an ideal venue for study of ESA implementation in the Southwest, offering unique biological resources coupled with an extensive livestock grazing program. The CNF encompasses habitat for more T&E species than any other forest in the southwestern region, and the region ranks second among FS regions in the country for numbers of listed species. There were 197 active grazing allotments and 145 grazing permittees on the CNF in May 2000 with roughly 30 000 head of adult cattle allowed to harvest approximately 315 639 AUMs of forage annually.

Spurred by lawsuits, in 1998 the CNF initiated a forestwide, streamlined, 30-species section 7 consultation with the FWS on its entire grazing program. For each species, the CNF developed broad guidance criteria for determining the effects of grazing on T&E species. For example, the criteria determined that where agaves were present, grazing during the 5-month bolting period would be "likely to adversely affect" lesser long-nosed bats since the bats depend on agave nectar for food (USDA Forest Service 1998a). Any grazing plans not conforming with the criteria would be subject to formal consultation. The criteria were applied to 187 of the CNF's grazing allotments, resulting in 159 allotments receiving at least 1 determination of "may affect, likely to adversely affect," triggering formal consultation with the FWS (USDA Forest Service 1998b).

STUDY OBJECTIVES AND HYPOTHESES

Our study had 3 main objectives: 1) to examine CNF permittees' attitudes toward T&E species regulation and their perceptions of how they are affected by ESA implementation, 2) to assess how permittees' perceptions of impact are related to the outcomes of biological assessments and to attitudes regarding their relationship with the federal government, and 3) to explore the relationship between permittees' attitudes toward federal regulation generally and their attitudes toward the ESA specifically.

With respect to objective 1, we anticipated, based on pilot interviews, that a majority of survey respondents would perceive negative impacts to their operations from T&E species, value economic growth over species conservation, believe that the ESA is being used as a tool to eliminate grazing from public lands (USHR 1998), and think that the ESA needed to be revised to prevent its misuse. We also anticipated that the majority of permittees would view the ESA as a threat to

private property rights, question T&E species listing decisions, and be reluctant to work with the FWS. Based on previous research (Huntsinger et al. 1997; Liffmann et al. 2000), we expected that a majority of survey respondents would view federal regulation negatively, as a loss of liberties and freedom.

With respect to objective 2, we hypothesized that permittees with more T&E species or habitats on their allotments would be more likely to perceive negative impacts from T&E species policies than permittees with fewer T&E species. These negative perceptions were expected because of the challenge of having to accommodate the needs of all T&E species into grazing plans and the concurrent potential for further restrictions. Furthermore, we expected that a positive relationship would exist between the degree of negative impact perceived from T&E species policies and the degree of dissatisfaction with FS T&E species management. McClaran and King (1999) found that satisfaction with FS planning was positively correlated with expected future personal benefits. These findings were applied to the current context in the Southwest and interpreted to mean that permittees perceiving negative impacts would likely anticipate a loss of personal benefits from the species assessment and consultation process. We further anticipated that the degree of negative impact perception would be positively related to the degree of perceived tenure insecurity. Previous research in both Utah (Coppock and Birkenfeld 1999) and California (Liffmann et al. 2000) found that large majorities of livestock permittees see closure of the public range as a threat to ranching. Finally, we hypothesized that perception of impact from T&E species policies would be related to general underlying attitudes toward federal regulation. Specifically, we expected that permittees who hold anti-federal government regulation sentiment would be more likely to perceive negative impact from T&E species policies than permittees who do not hold negative attitudes toward federal regulation.

With respect to objective 3, we hypothesized that permittees' underlying attitudes toward federal regulation in general would be positively associated with their acceptance or resistance to ESA and their attitudes toward working with the federal agencies responsible for enforcing T&E species regulations in their allotments. Attitude theory holds that specific attitudes should be consistent with more general attitudes, and this relationship was found in previous research showing that attitudes toward federal grazing management were largely a reflection of broader environmental attitudes (Brunson and Steel 1996).

METHODS

Sampling Frame

A quantitative mail survey was designed according to Salant and Dillman's (1994) guidelines. The survey was sent in May 2000 to all permittees (145) on the Coronado National Forest. A universal sample was used because of the small size of the target population. Survey implementation followed the guidelines of Salant and Dillman (1994) except for the omission of the introductory postcard. This was done to save time and postage. A first survey with an introductory cover letter was sent to every permittee on the CNF and was followed 1 week later with a reminder postcard. Two weeks later, an additional survey and reminder were sent to those permittees who had not

yet responded. The final response rate was 89 permittees, or 61% of the total on the CNF.

A nonresponse bias analysis was conducted to determine whether respondents and nonrespondents differed with respect to geographic location, scale of the ranching operation (permitted AUMs), and ESA impact (number of T&E species assessed per permittee). We found that permittees on the Catalina District of the CNF, located close to Tucson, Arizona, were less likely to respond to the survey than those from other districts. Respondents also generally had larger operations and higher numbers of T&E species being assessed on their allotments. Thus, permittees nearer to large urban areas, those with fewer CNF AUMs, and those with fewer species at issue on their allotments may be underrepresented in the survey. Our results are therefore most relevant in describing the perceptions and attitudes of CNF permittees with large ranches located in more remote rural areas and who are more likely to experience significant impacts from the ESA due to the number of listed species present on their allotments. This pattern of responses is not surprising since individuals are more likely to respond to a survey on a topic about which they are concerned or knowledgeable, and permittees with more listed species and larger ranches likely have more at stake with respect to the application of the ESA to their allotments. Although caution should be used in generalizing from our results to all CNF permittees, 61% of all permittees on the CNF responded to the survey, representing a significant proportion of permittees on the forest.

A further caution is required with respect to generalizing to permittees on other national forests. Because of the large number of listed species on the CNF and the history of environmental litigation targeting grazing allotments, the CNF may be considered an extreme case in relation to ESA impacts on permittees and potentially permittee responses to these impacts. Thus, the experiences and views of CNF permittees may not be representative of permittees on all national forests but are especially likely to represent the attitudes that may develop where the number of T&E species and the threat of ESA-based litigation are high.

Survey Design

A pilot study was initially conducted on the Tonto National Forest (TNF) to develop hypotheses for further testing on the CNF. Fourteen TNF permittees were interviewed by telephone and asked 13 mostly open-ended questions about the impact of T&E species on their ranching operations. Mail survey questions were developed based on the pilot study, existing literature, and our knowledge of the local management situation. Survey questions related to the following broad areas: 1) permittees' perceptions, values, attitudes, and actions related to T&E species management (their perceptions of the impact of T&E species on their operations, their conservation values, their attitudes toward T&E species management specifically and the federal government generally, and their responses to T&E species regulation); 2) ranching practices (use of rotational grazing, riparian fencing, prescribed burning, etc.); 3) characteristics of the ranching operation (herd size, income, number of deeded acres, etc.); and 4) demographic characteristics of the individual respondents (education, age, etc.).

Table 1. Results of principal components analysis of survey questions pertaining to regulation and management of the national forests. Survey respondents were grazing permittees on Coronado National Forest, Arizona.

Survey item	Extracted communalities	Pattern matrix	
		Component 1	Component 2
Q14a Federal regulation means a loss of liberties and freedom	0.756	0.873	
Q14b The national forest system is overregulated	0.786	0.822	0.143
Q14c The Forest Service adequately seeks my input on decisions that affect me	0.726		-0.862
Q14d Recreation is being favored over other multiple uses on forest lands	0.299	0.592	-0.208
Q14e My relationship with the Forest Service has declined in recent years	0.722		0.869
Q14f The federal government should not retain land	0.560	0.734	0.311
Total variance explained ¹	45.02%		19.13%

¹As taken from eigenvalues and sum of squares loadings. Two components were retained. The remaining components individually explained no more than 15% of the variance.

Several additional variables obtained from existing data were also used in our analysis, including the number of permitted AUMs (an indicator of operational scale), the number of T&E species per permittee with any “may affect” determinations, and the number of T&E species with “may affect, likely to adversely affect” designations. These latter 2 variables represent the general influence of T&E species on the ranching operation and the potential severity of the impact, respectively. The survey was pilot tested on TNF permittees and reviewed by FS range management personnel and academic survey research experts. Based on comments provided by these reviewers, revisions were made before sending out the final survey.

Analyses

Two types of analyses were performed. First, for each of 3 groups of attitude items on the survey, principal components analysis (PCA) was used to assess construct validity and to guide question selection for further analysis (Black 1999). A promax rotation with Kaiser normalization was performed on each set of question items to simplify interpretation of the factor loadings (Jackson 1991). Promax is an oblique rotation that facilitates examination of multivariate data by clustering variables into groups (Jackson 1991). We selected it for our analysis because it provided the most clearly interpretable results (Stevens 1992).

Table 1 displays the results of the PCA of question 14, which contained 6 attitude items related to permittee attitudes and beliefs about regulation and management of the national forests. Each number in the component columns represents the partial correlation between the item and the rotated component. Higher correlation values indicate items that were more important in defining that particular principal component. Items that correlated highly with the first 2 principal components were retained for descriptive analysis, and those highly correlated with the first component were the focus of hypothesis testing. In Table 1, the first component explained 45% of the variance with high correlations with items a, b, and f. These items clearly addressed permittee attitudes and underlying ideology regarding federal regulation. The second component explained 19% of the variance and was highly correlated with items c and e. These items expressed permittee attitudes specifically toward the FS. Item d, which related to permittee views on recreation, was not highly correlated with either of the first 2 components and also was

not directly related to attitudes about the ESA. This item was excluded from subsequent analyses.

Second, chi-square contingency tables were constructed to test hypotheses. Chi-square analysis is frequently used in social science research where hypotheses require testing for associations where at least 1 variable is categorical and to compare frequency distributions between groups for ordinal or nominal data. To facilitate this analysis, data on species occurrences on each respondent’s allotments (the number of species receiving “may affect” and “likely to affect” designations) were transformed into ordinal data with 2 categories. Ordinal Likert-type data with multiple categories were also collapsed into 2-category variables. Combining variables into 2 categories was done both to minimize the number of cells with expected frequencies of less than 5 and to simplify the interpretation and presentation of results. Pearson’s chi-square statistic was used to assess the independence of each pair of variables using the cross-tabulation procedure in SPSS (SPSS 1999). Where expected frequencies were less than 5, Fisher’s exact test replaced the Pearson’s chi-square test. Null hypotheses were rejected when $P < 0.10$. Data were analyzed using SPSS (SPSS 1999).

Since collapsing variables into 2 categories reduces the variation in the data and may therefore artificially inflate significance values, ordinal-by-ordinal correlations were also performed using all categories for both variables in each analysis. Significance of ordinal correlations was assessed using Kendall’s tau in SPSS (Sirkin 1999). This analysis resulted in identical conclusions as the chi-square analysis described above (i.e., the same hypotheses were accepted and rejected as with the collapsed data categories in the chi-square analysis). Therefore, we report and present the results from the chi-square analysis of 2×2 contingency tables to facilitate the display and interpretation of our results.

RESULTS

Respondent Characteristics

Respondents had base herds of mother cows ranging from 0 to 1 100 head, averaging 211, with the largest number of ranches falling in the 100- to 200-head range. One operation with no cows had opted for temporary nonuse. The average makeup of respondents’ ranches in terms of land area, accounting for both deeded land and land on which forage was leased from a federal or state agency, included 58% FS, 19% private, 18% state,

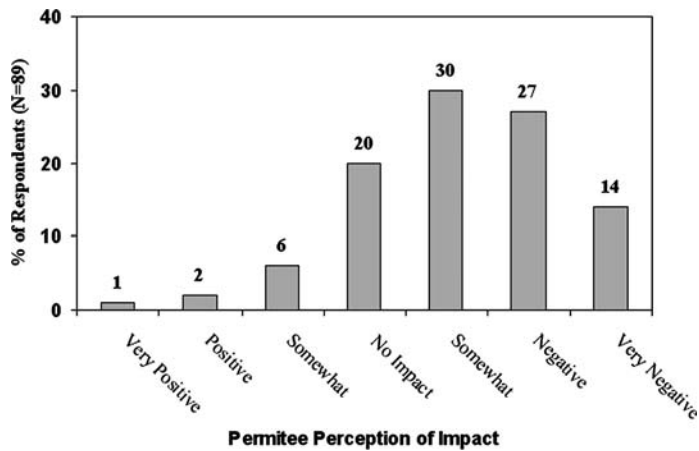


Figure 1. Relative frequency of permittees' perceptions of impact to their ranching operations from threatened and endangered species policies on the Coronado National Forest, Arizona.

4% BLM, and 1% other land. FS land comprised anywhere from .05% to 99.9% of operations. Private holdings ranged from 16 hectares to 10 522 hectares with an average of 1 480 hectares. The private holdings of all respondents combined amounted to 110 977 hectares.

Half of respondents grossed over \$60 000 on average from all income sources. Thirty-six percent of the total reported gross incomes above \$100 000, and another 22% reported earning between \$20 000 and \$40 000. The average respondent ranch earned 50% of their income from livestock, 48% from off-farm employment, and 1% each from crops and wildlife (hunting, tours, etc.). Half of respondents had 85% or more of their labor needs provided by family, while only a quarter of the operations received over 50% of their labor from outside sources.

Respondents ranged in age from 27 to 92 years, the mean age being 60 years. Survey respondents were well educated, with over 60% having completed a 4-year college degree. Twenty-two percent had graduate degrees, while another 28% had completed some college course work. Only 5% of respondents had not completed high school. On average, respondents had managed their current operation for 24 years.

Perception of ESA Impact and Tenure Security

A majority of respondents (71%) perceived their grazing operations as being at least somewhat negatively affected to some degree by endangered species-related policies (Fig. 1). Still, a significant percentage of respondents perceived no impact at all (22%), while 9% reported positive impacts. The most frequently selected impacts were increased operating costs (44%), decreased ranch value (39%), decreased permitted numbers of livestock on FS allotments (35%), disruption of rotational grazing plans (29%), and delays in approval of proposed improvement projects (29%) (Fig. 2). Impacts mentioned in the "other" category included a decrease in time available for on-site management, loss of time responding to BAs and BOs, psychological stress, and frustration over perceived abuse of the ESA by environmental groups.

Of the possible impacts, respondents found permit reductions to be the most difficult to cope with (21%), followed by

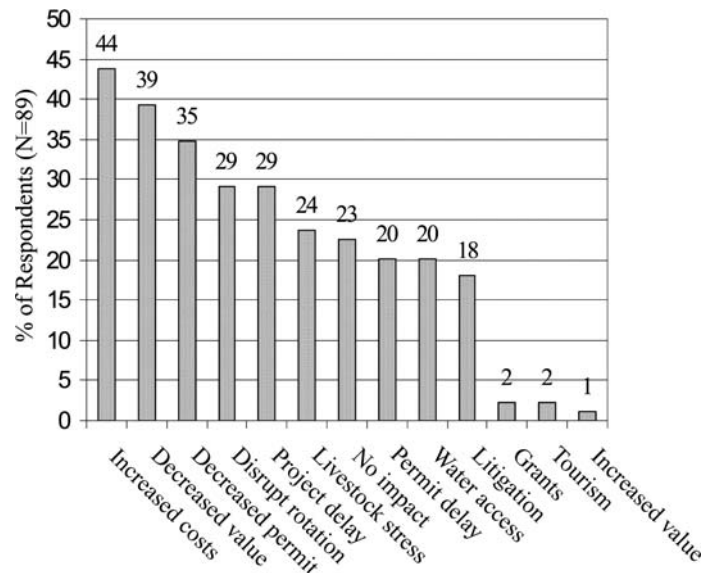


Figure 2. Relative frequency of different types of impacts experienced by Coronado National Forest permittees as a result of threatened and endangered species policies.

becoming involved in litigation (19%) and decreased ranch value (15%). Respondents were least concerned about project delay (23%), disruption of rotational grazing plans (20%), and increased stress on livestock (13%).

Only 25% of respondents expressed any level of confidence that they would have access to a grazing permit 10 years from now. A slightly higher percentage of permittees (38%) were confident that they would still have a livestock operation at all in the next decade. Despite the uncertainties, 79% of respondents were at least somewhat committed to keeping their operations going "no matter what."

Permittee Attitudes, Beliefs, and Values

A majority of respondents (65%) had some concern for T&E species, but if forced to make a choice, they believed that economic growth should come first. However, only 10% felt that economic growth should be given priority even if it reduces the chances for T&E species conservation. Twenty-five percent of permittees were willing to put T&E species conservation before economic growth, and 90% had at least some concern for T&E species.

Permittees on the CNF held a unified perception that the ESA is being used as a tool to eliminate grazing from public land. Ninety-three percent of respondents agreed with this statement (Table 2). Permittees overwhelmingly agreed that the ESA needs to be revised to prevent its misuse (90%), but fewer respondents (46%) would advocate complete revocation of the act. Most respondents (87%) saw the ESA as a threat to private property rights, and a large percentage (78%) of respondents believed that many T&E species in the Southwest have been listed in error. Fifty-two percent of respondents believed that they would be able to manage around T&E species, and 60% of respondents agreed that they would be willing to work with the FWS even though only 15% believed that the FWS was willing to work with them. Only 2 permittees thought the ESA rewards good management.

Table 2. Coronado National Forest permittees' attitudes toward the Endangered Species Act (ESA) and threatened and endangered species management.

	Percentage of permittee respondents who ...					N
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
The ESA is being used as a tool to eliminate grazing on public land	78	15	5	2	0	88
The ESA should be revoked	27	19	32	14	9	81
The ESA should be revised to prevent its misuse	83	7	8	1	1	86
The ESA threatens private property rights	71	16	8	1	4	86
The ESA rewards ranchers for good management	1	1	15	25	58	81
Endangered species provide ranchers new opportunities	4	7	19	14	57	81
Many threatened and endangered species in the Southwest have been listed in error	57	21	17	2	2	86
I am willing to work with the Fish and Wildlife Service	24	36	28	5	7	83
The Fish and Wildlife Service is willing to work with ranchers	4	11	22	25	39	83
I believe I will be able to manage around endangered species	33	19	30	12	6	83

Attitudes and Values Regarding the Federal Government

Seventy-seven percent of respondents agreed that “federal regulation means a loss of liberties and freedom,” and 72% felt that the national forest system is overregulated (Table 3). Fifty-six percent of respondents thought that the federal government should not retain land. Two respondents specified that the government should retain land only as provided for in the U.S. Constitution, meaning military bases, veterans facilities, and post offices.

Despite their uncomfortable coexistence with the federal government, survey respondents had mixed feelings about the FS. A mere 21% of respondents thought that their relationship with the FS had declined in recent years with 33% neutral on this statement and 41% disagreeing. Overall, only 35% of respondents felt that the FS adequately sought their input on decisions affecting them (Table 3). While only 21% of respondents reported a decline in relations with the FS, a larger percentage (44%) of respondents overall were dissatisfied to some degree with FS handling of T&E species management issues on their allotments with 19% being very dissatisfied. Another 19% remained neutral on the issue, while 38% reported being satisfied to some degree with FS management.

Permittee Perceptions of Impact in Relation to Species Occurrence, Attitudes, and Values

Contrary to initial hypotheses, little if any relationship existed between permittees' perception of impact and the 2 species impact variables (i.e., whether a BA had concluded that grazing “may affect” or is “likely to adversely affect” 1 or more T&E species; Table 4). As anticipated, there was a positive relation-

ship between perception of negative impacts from T&E species policies and dissatisfaction with the FS. Permittees reporting negative impacts from T&E species policies were 3 times more likely than others to be dissatisfied with FS management of T&E species on their allotments.

Contrary to the initial hypothesis, perception of impact from T&E species policies remained largely independent of perception of tenure security. Respondents lacked confidence in their future access to a FS grazing permit regardless of whether they perceived negative impact from T&E species policies. As expected, permittees who agreed that “federal regulation means a loss of liberties and freedom” were more likely to perceive negative impacts than those who disagreed.

Permittee Values and Acceptance of Threatened and Endangered Species Policies

Four variables were used to characterize acceptance or resistance to T&E species policies: 1) permittees' values regarding the balance between T&E species conservation and economic growth, 2) permittees' attitudes regarding the listing of species in the Southwest, 3) permittees' willingness to work with the FWS, and 4) whether permittees thought the ESA ought to be revoked. Species impact variables and the attitudinal variables described above were compared with categories of agreement and nonagreement with the statement, “Federal regulation means a loss of liberties and freedom.” Permittees' attitudes toward this variable remained independent of the number of species at issue for any particular allotment.

Willingness to work with the FWS was the only attitudinal variable that was not significantly related to attitudes toward

Table 3. Coronado National Forest permittees' attitudes toward federal regulation and the US Forest Service.

	Percentage of permittee respondents who ...					N
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
Federal regulation means a loss of liberties and freedom	49	28	11	8	3	88
The national forest system is overregulated	45	27	19	8	1	86
The Forest Service adequately seeks my input on decisions that affect me	9	26	22	21	22	87
My relationship with the Forest Service has declined in recent years	12	15	33	20	21	87
The federal government should not retain land	48	8	23	6	15	87

Table 4. Relationship between permittees' perceptions of impact from threatened and endangered species regulation, species occurrence variables (number of "may affect" and "likely to affect" determinations for permittees' allotments), and permittees' perceptions and attitudes.

	Impact perception (%)	
	No negative impact	Negative impact
	(<i>N</i> = 24) ¹	(<i>N</i> = 57) ¹
Species occurrence		
May affect		
1–2 species	47.8	30.9
3–7 species	52.2	69.1
	<i>P</i> = 0.156 ²	(<i>n</i> = 78)
Likely affect		
0–1 species	65.2	67.3
2–3 species	34.8	32.7
	<i>P</i> = 0.861	(<i>n</i> = 78)
Perceptions and attitudes		
Satisfaction with Forest Service		
Satisfied	71.4	25
Not satisfied	28.6	75
	<i>P</i> < 0.001	(<i>n</i> = 77)
Tenure security		
Not confident	75	77.2
Confident	25	22.8
	<i>P</i> = 0.832	(<i>n</i> = 81)
Federal regulation		
Agree is loss of freedom	58.3	83.9
Don't agree	41.7	16.1
	<i>P</i> = 0.014	(<i>n</i> = 80)

¹*N* varies slightly with question.

²*P* values represent chi-square probabilities that there is no difference in the distribution of the proportions between no negative and negative perceptions of impact.

federal regulation. The remaining variables revealed tendencies to respond one way or another, depending on one's attitude toward federal regulation (Table 4). Respondents who agreed that federal regulation means a loss of liberties and freedom were more than 6 times as likely to doubt their future access to a FS grazing permit, more than twice as likely to be unsatisfied with FS management of T&E species on their allotment, 4 times more likely to value economic growth over T&E species conservation, and more than 5 times as likely to believe that many species in the Southwest had been listed in error (Table 5). One hundred percent of the permittees who did not agree that federal regulation means a loss of liberties and freedom also did not agree that the ESA should be revoked, while 58.7% of the permittees who did agree with the statement regarding federal regulation also thought the ESA should be revoked (Table 5).

DISCUSSION

Ninety percent of permittees surveyed maintained that they had at least some concern for the fate of T&E species. However, 75% of respondents, if forced to make a choice, would value

Table 5. Relationship between permittees' attitudes toward federal regulation and their perceptions and attitudes regarding tenure security, satisfaction with the US Forest Service, implementation of the Endangered Species Act (ESA), and willingness to work with the US Fish and Wildlife Service (FWS).

	Federal regulation means loss of liberties	
	Agree	Don't agree
	(<i>N</i> = 68) ¹	(<i>N</i> = 20) ¹
Perceptions and attitudes		
----- % -----		
Tenure security		
Confident	85.3	45
Not confident	13.7	55
	<i>P</i> < 0.001 ²	(<i>n</i> = 88)
Satisfaction with Forest Service		
Satisfied	29.2	68.4
Not satisfied	70.8	31.6
	<i>P</i> = 0.002	(<i>n</i> = 84)
Economics vs. species		
Economics first	82.3	52.9
Species first	17.7	47.1
	<i>P</i> < 0.012	(<i>n</i> = 79)
ESA should be revoked		
Agree	58.7	0
Don't agree	41.3	100
	<i>P</i> < 0.001	(<i>n</i> = 81)
Southwest listings are erroneous		
Agree	86.2	50
Don't agree	13.8	50
	<i>P</i> = 0.001	(<i>n</i> = 85)
Willing to work with FWS		
Agree	59.4	66.7
Don't agree	40.6	33.3
	<i>P</i> = 0.575	(<i>n</i> = 82)

¹*N* varies slightly with question.

²*P* values represent chi-square probabilities that there is no difference in the distribution of the proportions between no negative and negative perceptions of impact.

economic growth over species conservation. This utilitarian view of nature by resource-dependent users has been exhibited in previous surveys (Brunson and Steel 1996; Kellert 1996) and may reflect a rancher stewardship ethic that views these priorities as complementary rather than mutually exclusive (Peterson and Horton 1995).

Respondents overwhelmingly agreed that the ESA is being used as a tool to eliminate ranching from public land, and three-quarters believed that many T&E species in the Southwest have been listed in error. The vast majority of permittees also agreed that the ESA needs to be revised to prevent its misuse. These results reflect a view articulated by some permittees in the survey margins that the ESA is part of a larger effort to eliminate public land grazing.

Forty-six percent of respondents advocated complete revocation of the ESA. These results compare to a national survey in which only 5% of respondents wanted the act revoked, while 10% of westerners supported revocation (Czech and Krausman 1999). The urban/rural dichotomy may be more significant than the eastern/western one. Brunson and Steel (1996) found

that natural resource-dependent regions such as eastern Oregon were more likely to support the repeal of endangered species laws and less likely to support greater protections for nonforage resources than urban Oregonians or the nation as a whole. Kellert (1996) found similar attitudes among people of rural upbringing, emphasizing that where one comes from may be more important than where one lives in determining attitudes toward biodiversity. Similarly, Brunson and Gilbert (2003) found that rural versus urban/suburban upbringing was a strong predictor of recreation visitors' attitudes toward policies that allow livestock grazing on a newly designated national monument managed by the BLM.

Despite the prevalence of negative views about the implementation of the ESA and moderate support for its revocation, a third of respondents reported a willingness to work with the FWS, and 90% reported having at least some concern for T&E species. However, permittees did not perceive the federal agencies as having the same willingness to engage or responsiveness to permittee concerns. Few respondents reported a recent deterioration in their relationship with the FS. However, twice as many were dissatisfied to some degree with FS handling of T&E species issues on their allotments, and only a third of respondents felt that the FS adequately sought their opinion on decisions that impact them.

Permittees who perceived negative impacts from T&E species policies were more than 3 times as likely to be dissatisfied with FS T&E species management. These findings are consistent with those of McClaran and King (1999), who found that support for FS planning decisions strongly correlated to perceptions of expected personal benefits for permittees.

Most permittees perceived negative impacts to their livestock operations from T&E species policies, including increases in operating costs, decreases in ranch values, and decreases in permitted numbers of livestock. Yet respondents who did not perceive such impacts reported just as many "may affect" and "likely affect" biological assessments as those who did. It is possible that negative perceptions stemmed not simply from the presence of T&E species but from specific interactions with regulatory agency personnel and required on-the-ground changes in management. Once guidance criteria for assessment of effects of livestock grazing on T&E species were established, a process of negotiation and adjustments in management to avoid formal consultation likely occurred. For example, agreement to fence certain critical areas or rest pastures for specified periods can be addressed early in the consultation. The nature of these negotiations may have influenced individual responses. Congressional hearings on implementation of the ESA in the Southwest suggested that this kind of activity was taking place on some allotments (USHR 1998).

A majority of survey respondents doubted they would have access to a grazing permit on the CNF 10 years from now. However, these feelings of tenure insecurity were not significantly related to perception of impact from T&E species policies. These results suggest that issues other than the ESA are affecting permittees' perceptions of tenure security. If an aging rancher population and poor cattle prices are not to blame, then it is possible that regulations in general are to blame. This would be consistent with the perception, held by over 90% of survey respondents, that the ESA is merely a tool in a larger scheme to eliminate grazing from public lands.

Underlying Ideology of Federal Regulation: An Important Determinant?

Seventy-seven percent of all respondents agreed that "federal regulation means a loss of liberties and freedom." These same respondents were 4 times more likely to report negative impacts from T&E species policies than respondents who were neutral or disagreed with the statement. This can mean either of 2 things: that permittees who are negatively affected by T&E policies are more likely to believe government regulations limit their freedom or, alternatively, that people whose fundamental value system emphasizes personal rights and freedoms are more likely to perceive that they've been negatively affected by T&E species policies regardless of actual impacts. The difference, while subtle, is important because land managers may be able to revise regulations or procedures to reduce negative consequences, but they cannot change permittees' underlying ideology.

Although we cannot assert causality based on our analysis, an indication that the results reflect a common ideological viewpoint among permittees is the finding that attitudes toward federal regulation were related to a number of variables, including perceptions of tenure security, satisfaction with FS management, and acceptance of T&E species policies. This survey was an attempt to understand the prevalence of certain attitudes and values among permittees and to determine if the distribution of these attitudes and values could be explained through other variables. Oppenheim (1992) distinguishes between different layers of attitude, deeply held views rooted in a person's fundamental life philosophy, and more superficial attitudes. These deep-seated attitudes may be a part of a person's "personality," coming close to fundamental personal values. This phenomenon has been noted before in studies of attitudes toward federal range management policies. For example, Brunson and Steel (1996) found that attitudes toward grazing were largely a reflection of broader underlying attitudes toward the proper relationship between humans and nature. The statement that read "federal regulation means a loss of liberties and freedom," drawn from a survey initially conducted by Huntsinger and Fortmann (1990), appears to reflect such a broad attitude and may best be expressed as a permittees' underlying ideology of federal regulation. We believe the response to this question may be a very important determinant of respondent attitudes and beliefs regarding T&E species management and regulation.

In evaluating the usefulness of this study for guiding public land management, decision makers may question whether the predominance of antiregulatory attitudes in this survey is representative of federal grazing permittees generally or a reflection of a study population with unusually antigovernment attitudes. While this study examines only permittees in a single national forest, comparison with other research suggests that the views of CNF respondents to this survey are consistent with the views of ranchers across the state of Arizona on key attitudinal variables. In a survey of Arizona ranchers in 5 counties across the state, including permittees on 4 other national forests, as well as BLM permittees and Arizona State Land lessees, an even larger proportion of respondents held the view that "government regulation means a loss of liberties and freedom" (86%) than on this survey (77%)

(Fernandez-Gimenez et al. 2005a). Similarly, the statewide survey found that fewer respondents (31% vs. 35% on this survey) felt that the government adequately consulted them about decisions that affect them.

IMPLICATIONS FOR ESA ADMINISTRATION

This survey of CNF permittees revealed that an overwhelming majority of permittees perceive that the ESA is being used as a tool to eliminate grazing from public land. Such a view may discourage some permittees from rising to meet new environmental standards and lead others to question the legitimacy of any scientific data concluding that livestock removal or changes in management are necessary.

Survey results revealed that perceptions of negative impact as well as various attitudes expressing acceptance or resistance to T&E species policy are associated with attitudes toward the FS and federal regulation in general. These findings have important implications for ESA administration. Those interested in minimizing these impacts and increasing acceptance of T&E species policies will be more successful if they possess some knowledge of the deeply held attitudes of the target population.

Not all ranching operations perceive negative impacts from T&E species policies, and many permittees would support efforts to recover T&E species. In fact, 22% of respondents perceived no impacts at all, and another 9% reported positive impacts to their operations. Ninety percent of respondents had at least some concern for the conservation of T&E species, and 25% of respondents were willing to elevate the concerns for T&E species conservation above those of economic growth. All these factors suggest that regardless of the fundamental value conflicts they may have with federal regulatory approaches, many permittees express a stewardship ethic, and most are willing to work to find solutions that minimize or mitigate the effects of ranching on T&E species. These findings are in line with another recent survey of Arizona grazing permittees that found that 76% of permittees were willing to invest their own resources to monitor their public land grazing allotments if the land management agency would accept their data, and a majority was supportive of collaborative approaches to natural resource management (Fernandez-Gimenez et al. 2005a, 2005b). Unfortunately, two-thirds of respondents to our survey did not perceive that their willingness to cooperate was reciprocated by the FWS. Further, only 35% of respondents felt that the FS adequately consulted them on issues affecting their operations. While the nature of ESA limits the ability for federal officials and grazing permittees to work toward compromises on T&E species protection, it appears likely that permittees' concerns could be eased by opportunities for more meaningful local participation in the process. One such opportunity might be greater use of permittees' own data and local knowledge in developing science-based but locally developed management prescriptions. Greater reliance on economic incentives rather than regulatory directives to work toward recovery goals might also enhance cooperative relationships between permittees and agencies.

Permittees who perceived fewer negative impacts from T&E species tended to be smaller, newer operations with less

dependence on livestock for income. These newer permittees may represent opportunities for collaboration in the recovery of T&E species. However, it remains to be seen what their long-term commitments are to ranching and to the landscape. Frequent turnover of ranches and permits may have implications for T&E species management on federal rangelands. This is especially true when one considers that traditional ranchers are not currently buying ranches in the west (Gosnell and Travis 2005) and the relatively small influence that livestock income has on ranch values at the time of sale (Torell et al. 2005).

Finally, survey results imply that the messenger may be more important than the message in influencing permittee willingness to change behavior or innovate. Changes proposed by the FS or the FWS may be viewed with suspicion by permittees but may seem more credible coming from another permittee (Bright and Manfredi 1993; Weeks and Packard 1997). This finding echoes those reported by Fernandez-Gimenez et al. (2005a), who found that permittees viewed fellow ranchers as the most reliable source of information on rangelands and the FS as among the least credible sources. Agencies should consider collaborative recovery pilot projects with willing permittees and use them as education and outreach tools to influence more skeptical or cautious operators.

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