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## Utah stakeholders' attitudes toward selected cougar and black bear management practices

*Tara L. Teel, Richard S. Krannich, and Robert H. Schmidt*

**Abstract** We examined Utahns' attitudes ( $n=901$ ) toward use of recreational hunting to manage black bears (*Ursus americanus*) and cougars (*Puma concolor*), use of hounds to hunt these species, and the practice of bear baiting. Independent variables included urban versus rural residence, gender, educational attainment, age, duration of in-state residence, and stakeholder group classification. Most Utahns disapproved of the cougar and black bear management practices examined. Differences in responses were associated with sociodemographic characteristics and with participation in wildlife-related recreation. The following groups were less opposed to the selected practices than their counterparts: rural residents, men, those with lower levels of education, longtime residents, younger respondents, and hunters. Survey analyses can help wildlife managers identify areas of controversy where public involvement and educational efforts might be prescribed.

**Key words** attitudes, black bears, cougars, predator management, stakeholders, survey, Utah

Predator management is one of the more controversial components of wildlife management (Messmer and Rohwer 1996). Predators have been managed for numerous purposes, including reducing losses to domestic livestock, protecting game populations, and eliminating threats to human safety (Grange 1949, Leopold 1933, Schmidt 1986, Wagner 1988, Gilbert and Dodds 1992, Messmer and Rohwer 1996). However, these justifications are not universally accepted. Public approval of specific predator management practices often depends on which of these motives is behind their use (Manfredo et al. 1998, Manfredo et al. 1999, Messmer et al. 1999, Reiter et al. 1999). As an example, certain lethal control techniques may be more acceptable when predators threaten human health and safety (Zinn et al. 1998). Additionally, some predator management

practices are publicly unacceptable regardless of the context in which they are used. For example, animal protection activists tend to believe that certain techniques (e.g., trapping) are fundamentally wrong because they are inhumane and can hurt individual animals (Schmidt 1990). Evidence of debate over specific practices can be found in the increasing number of recent ballot initiatives aimed at banning such management strategies as hunting and trapping (Loker and Decker 1995, Minnis 1998). Due to the controversial nature of predator management issues, it is important to determine public attitudes regarding the topics before policies are developed, implemented, or revised.

Managing specific predator species such as cougars (*Puma concolor*) and black bears (*Ursus americanus*) has been a focus of widespread public

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controversy and debate during the 1980s and 1990s (Fulton et al. 1995, Loker and Decker 1995, Carter 1998, Manfredo et al. 1998, Peyton 1998). Recreational hunting is a major source of mortality in cougar and black bear populations (Ross and Jalkotzy 1992), and contributes to increased physiological stress for individual animals (Harlow et al. 1992). Although these and other arguments are emphasized by those who oppose hunting, some traditional user groups argue that these large predators are suppressing ungulate populations and that cougar and bear predation may pose a serious threat to the livelihood of livestock ranchers and the safety of people and pets living on the edge of the urban-rural interface (Beier 1991, Mansfield and Torres 1994, Blackwell 1995, Bolgiano 1996). In addition, many people who hunt cougars or bears obtain satisfaction from doing so and are concerned that an enjoyable form of recreation will be taken away if their hunting opportunities are eliminated (California Department of Fish and Game 1991).

Using hounds to hunt large predators is a practice that has caused some concern among certain stakeholder groups. Although this practice is regulated, it is being reevaluated by many management agencies in the United States and Europe (California Department of Fish and Game 1991, Beck et al. 1995). Concern for animal welfare (relative to the dogs and the hunted species) has substantially impacted public attitudes toward this practice (Peyton 1998). Proponents of the use of hounds argue that predators, especially cougars, cannot be hunted successfully by other means and that "hounding" reduces impacts on nontarget individuals by allowing a more selective harvest (Beck et al. 1995).

Bear baiting is another topic that has generated extensive debate. Supporters claim that baiting is needed to increase hunter success and to enable more selectivity in harvest of specific age and gender groups (Beck et al. 1995). Opponents contend that attracting bears to feeding stations violates the standards of "fair chase" and may contribute to bears seeking garbage and other "human handouts" (Beck et al. 1995).

Wildlife agencies face many challenges in managing large predators. Managers increasingly are asked to identify techniques that are not only ecologically sound and cost-effective but also acceptable to various publics. Consequently, it is important that managers learn about public attitudes toward predator management and use this information to develop and implement outreach and man-

agement programs that consider human preferences alongside wildlife population dynamics.

### *Conceptual background*

The goal of our research was to determine Utahns' attitudes toward selected cougar and black bear management techniques. An attitude may be defined as an evaluation, or "an index of the degree to which a person likes or dislikes an object, where 'object' is used in the generic sense to refer to any aspect of the individual's world" (Ajzen and Fishbein 1980:64). For this study, the attitude-object becomes the specific predator management practice being evaluated. Numerous variables are thought to at least indirectly influence attitudes in this context (Ajzen and Fishbein 1980). While the most influential of these tend to be beliefs about the attitude-object, these variables may also include sociodemographic characteristics. Despite evidence to indicate that the influence of external variables such as sociodemographics on attitudes is weak and indirect (Ajzen and Fishbein 1980, Donnelly and Vaske 1995), their impact (or lack thereof) may be worth noting in the attempt to build an overall model for attitude prediction.

More specifically, in terms of the implications of this study, the examination of potential differences in attitudes due to the influence of selected external variables may aid in the construction of a model that can later be used to predict public sentiment and reactions regarding the proposed implementation of a given predator management practice. By identifying which factors are correlated with attitudes toward the practice(s) in question, resource managers will be in a better position to determine future attitudes toward similar practices. In turn, because attitudes influence behavioral intentions, which impact behaviors (Ajzen and Fishbein 1980), identifying or predicting attitudes toward management practices can enable better prediction of public behaviors in the form of reactions to the implementation of those practices. This information can be very useful in allowing managers to predict *a priori* the reaction to proposed practices and thereby identify the need (or the lack thereof) for public involvement and communication efforts to alleviate potential sources of controversy that could lead to such actions as ballot initiatives.

A review of recent literature pertaining to attitudes toward predator (and, more broadly, wildlife) management revealed patterns relative to sociodemographic characteristics and stakeholder group

identity. For example, residents of rural areas tend to be more supportive of traditional forms of wildlife management (e.g., trapping and hunting), whereas urban residents are more likely to oppose these practices and support animal rights (Kellert 1984, Richards and Krannich 1991, Manfredo et al. 1997). Similarly, gender is a correlate of people's attitudes toward wildlife management. Women tend to be more supportive than men of protecting animals from suffering (Kellert 1976, Richards and Krannich 1991). They are more likely than males to be "animal activists," associated with the animal rights and animal welfare movements (Hooper 1994). In contrast, men tend to be more supportive of traditional wildlife management practices and less involved in animal rights movements (Kellert 1976, Kellert and Berry 1987, Hooper 1994, Manfredo et al. 1997).

Education is another frequently cited correlate of attitudes toward wildlife-related issues. Those with lower levels of education (i.e., without a college degree) tend to be less likely than their well-educated counterparts to become involved in "animal activism" (Hooper 1994). Not surprisingly then, these less educated groups are typically more supportive of hunting, trapping, and related practices (Kellert 1976). In terms of the influence of age, younger individuals (i.e., particularly between the ages of 18 and 29) tend to oppose these traditional practices and to show more of an interest in animal welfare considerations than their older counterparts (i.e., particularly those over 65; Kellert 1976; Fulton et al. 1995). While duration of residence is not as typical in the literature as some of the other variables mentioned here, there is evidence to suggest that longtime residents of a state or area are more likely than newcomers to support traditional forms of wildlife management (e.g., see Smith 1997, Zinn and Andelt 1999). The reasoning here results partly from the supposed "rural background" that is more common among longtime residents (Smith 1997), and the decreased tolerance for and heightened knowledge of local wildlife-related damage that can result from living in a given area for an extended period of time (Zinn and Andelt 1999).

Patterns also are evident based on stakeholder group classification. For example, hunters and anglers are typically more supportive of certain management practices such as trapping and predator control than are other types of wildlife stakeholders (e.g., wildlife viewers; Lohr et al. 1996; Manfredo et al. 1997; Brooks et al. 1999). In contrast,

nonconsumptive users who do not hunt or fish, particularly birdwatchers and backpackers, tend to oppose such practices (Kellert 1976). Within the nonrecreational (or nonuser) group, there is a diversity of attitudes concerning wildlife-related issues, making it difficult to identify a broad orientation. Given this notion, it may prove useful to divide this group into subgroups using other variables such as knowledge of wildlife-related issues and level of interest in the resource (e.g., see Dahlgren et al. 1977, Zinn and Manfredo 1996).

### *Study purpose*

Our analysis focused on Utahns' responses to several survey items regarding predator management. Specifically, we examined attitudes toward hunting cougars and black bears, using hounds to hunt these species, and bear baiting. We made comparisons among various stakeholder groups (e.g., hunters and nonconsumptive users) who may feel differently about wildlife issues based on their patterns of involvement in wildlife-related activities. In addition, we examined sociodemographic characteristics, including current geographic location (i.e., urban versus rural residence), gender, age, educational attainment, and duration of residence in Utah as potential correlates of attitudes toward the selected predator management practices. The broad expectation based upon evidence in the literature (e.g., Ajzen and Fishbein 1980; Donnelly and Vaske 1995) was that differences in attitudes based upon these selected characteristics exist but that their influence on attitudes toward predator management is relatively weak. We expected residents of rural areas, men, those with lower levels of education, older respondents, longtime residents of Utah, and hunters to be more supportive than others of the practices examined in this study.

## Methods

### *Data collection*

A computer-assisted telephone interviewing system facilitated data collection. We used disproportionate stratified sampling as the primary sampling procedure. This method allowed for overrepresentation of rural areas for the purpose of accurate comparison of urban- and rural-resident response patterns. Interviews were completed by placing calls to a representative sample of residential telephone listings, with one-half representing residents of the 4 Wasatch Front metropolitan counties

(Davis, Salt Lake, Utah, and Weber) and one-half representing residents from the 25 remaining non-metropolitan counties. We statistically weighted cases after data collection to allow generalizations to be made to the state as a whole (Babbie 1990).

We conducted interviews with individuals who were  $\geq 18$  years old and whose birthdates had occurred most recently, thereby avoiding the overrepresentation of a particular gender or age group (Krannich and Cundy 1987). If the desired individual in a particular household was unavailable, or there was no answer, we made up to 5 callback attempts, after which we selected a replacement. We made calls on weeknights (with exceptions if someone needed to be reached during the day) and during the day and evening on the weekends to increase the likelihood of finding people at home. Overall, we obtained 901 completed interviews from the general public sample out of 1,332 eligible participants contacted, providing an overall response rate of 67.6%. The urban-area (67.3%) and rural-area (68.0%) response rates were similar. Time and funding constraints precluded our ability to conduct tests for nonresponse bias. However, we feel that our high response rates help to mitigate concerns in this area.

### *Measurement procedures*

We measured the predator management variables—representing attitudes toward hunting cougars and black bears, use of hounds to hunt these species, and the practice of bear baiting—by using a 0 to 10 intensity rating scale. We asked respondents to indicate their levels of approval for the practices by choosing a number between 0, representing strong disapproval, and 10, representing strong approval. This approach gave the respondent enough choices to accurately represent variation in attitudes while minimizing the level of difficulty associated with the response task by providing a familiar rating system (Converse and Presser 1986). Using an approach that provided for measurement on a continuous or interval scale also facilitated the use of statistical procedures that require measurement using quantitative (rather than categorical) scales (Labovitz 1967).

We categorized respondents according to geographic location (urban versus rural), gender (male versus female), educational attainment (college educated versus not college educated), age (under 25, 25–34, 35–44, 45–54, 55–64, and 65 or older), and duration of residence in Utah (1–10 yr versus

>10 yr). We also identified 5 mutually exclusive groups of stakeholders: hunters (defined as those who hunt big game, upland game, or waterfowl and may participate in other activities, such as fishing and nonconsumptive recreation), anglers (defined as those who fish and may participate in other forms of wildlife-related recreation, but do not hunt), nonconsumptive users (those who participate only in nonconsumptive forms of wildlife-related recreation, such as wildlife viewing), nonparticipants with high levels of interest in wildlife (respondents who do not participate in any of the above activities and who selected  $>5$  on a 0–10 response scale to a question rating their level of interest in wildlife), and nonparticipants with a low or neutral level of interest in wildlife (defined as respondents who do not participate in the above activities and who answered  $\leq 5$  on the wildlife interest question).

### *Data analysis*

We analyzed data using SPSS<sup>®</sup> for Windows<sup>™</sup> 6.0 (Norusis 1993). Due to our use of disproportionate stratified sampling in which residents of rural areas were overrepresented, responses were weighted to allow for accurate comparisons at the statewide level. We used the initial, unweighted data set containing approximately equal numbers of respondents from each geographic location for comparisons involving differences between urban and rural residents. For all other comparisons, we used the data set that was weighted to accurately represent the state as a whole. Weighting of the urban-area responses to adjust for the disproportionate stratification in the sampling design resulted in a substantial increase in the weighted number of cases reported for analyses based on the weighted data set. While this approach more accurately reflects the probable distribution of responses and the nature of associations among variables for the statewide population, it also has some effect on statistical significance tests, since the likelihood of obtaining a small probability value increases with the number of cases. However the original sample size was already quite large, and the effect of increased numbers of cases is attenuated when samples are large. Consequently, in this case the artificial increase in case numbers resulting from weighting had only minor effects on calculation of probability values, although probability values that were near to the critical value ( $P=0.05$ ) for designating statistical significance should be interpreted

with some caution. We used  $\alpha=0.05$  to determine statistical significance for all analyses.

We used independent samples *t*-tests and one-way analyses of variance (ANOVA) to examine differences in mean attitudes toward predator management practices across levels of the socio-demographic and stakeholder group variables. We used Tamhane's post hoc test for pairwise comparisons when ANOVA results were significant (Norusis 1993). We selected this procedure because Levene's test indicated that the equal variances assumption was violated in all cases. We examined hypothesized relationships through bivariate analyses and multivariate techniques to determine how the overall complex of independent variables helped to predict each of the individual attitude variables. More specifically, we applied ordinary least squares multiple regression, using scale and dichotomous, or dummy, variables and the entry method for selection of variables to be included (i.e., all independent variables were entered into the regression simultaneously based on the notion that, from theory, we expected all variables to be important; Morgan et al. 2001). We used the weighted data set for multiple regression analyses. A "test regression" run using weighted and nonweighted data revealed no major differences in results, further justifying the focus on results derived from the weighted data, which more accurately represented the state as a whole.

We created 3 dummy variables to replace the stakeholder group variable (using one less than the number of original levels as the guideline for the number of variables that need to be created in dummy variable regression, Zar 1996). These represented hunters, anglers, and nonconsumptive

users; nonparticipants (the 2 initial groups based on interest in wildlife were combined) served as the reference category.

## Results

We examined 2 sets of relationships among variables of interest. First we tested the significance of relationships among sociodemographic characteristics and selected predator management practices. We followed this by examining multivariate relationships to aid in building an overall predictive model for attitudes toward predator management.

### *Bivariate relationships*

*Overall attitudes toward predator management.* Great variability in patterns of response existed, as evidenced by large standard deviations associated with response variables (Table 1). While average attitudes toward all practices suggested opposition, respondents expressed less opposition for the general activities of cougar and bear hunting than for the controversial practices used to hunt these species. Utahns expressed little approval for using hounds to hunt cougars. They expressed the greatest amount of disapproval for bear baiting, followed by use of hounds to hunt black bears. It is important to note that responses to most predator management items formed a bimodal, and in some cases a trimodal, distribution. In other words, large percentages of respondents selected values at the extreme ends, or on either side, of the 0-10 scale, which resulted in a mean close to 5. This finding suggests that an interpretation of the results based solely upon mean levels of response would be unwise. A more appropriate approach, which we used in subsequent sections, accounts for the percentages of respondents who selected certain values or, more generally, who expressed approval versus disapproval.

*Geographic location.* While neither group of respondents expressed much approval for the selected predator management practices, rural-area residents were less opposed than urban residents to cougar hunting, using hounds to hunt cougars, and bear baiting (Table 2). This is evidenced by greater mean response values and greater percentages of respondents who selected a value above 5 on the 10-point scale than were associated with urban residents. All mean values were below the scale midpoint except for that representing average rural-resident response to cougar hunting. In this

Table 1. Mean levels of response by the Utah public to items measuring attitudes toward selected predator management practices, 1998.

| Practice <sup>a</sup>        | <i>n</i> <sup>b</sup> | $\bar{x}$ | SD   |
|------------------------------|-----------------------|-----------|------|
| Cougar hunting               | 826                   | 4.40      | 3.25 |
| Using hounds to hunt cougars | 810                   | 3.50      | 3.33 |
| Bear hunting                 | 827                   | 3.96      | 3.22 |
| Using hounds to hunt bears   | 810                   | 2.87      | 3.04 |
| Bear baiting                 | 841                   | 2.28      | 2.71 |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

<sup>b</sup> Numbers represent unweighted cases, which were displayed here to allow for easier interpretation.

Table 2. Utah public attitudes toward selected predator management practices across levels of geographic location, 1998.

| Practice <sup>a</sup>        | Residency             |           |            |               |          |           |            |               | <i>t</i> | <i>P</i> |
|------------------------------|-----------------------|-----------|------------|---------------|----------|-----------|------------|---------------|----------|----------|
|                              | Rural                 |           |            |               | Urban    |           |            |               |          |          |
|                              | <i>n</i> <sup>b</sup> | $\bar{x}$ | % Approval | % Disapproval | <i>n</i> | $\bar{x}$ | % Approval | % Disapproval |          |          |
| Cougar hunting               | 403                   | 5.10      | 48         | 38            | 423      | 4.20      | 34         | 50            | 3.98     | <0.001   |
| Using hounds to hunt cougars | 392                   | 4.13      | 34         | 54            | 418      | 3.33      | 22         | 63            | 3.27     | 0.001    |
| Bear hunting                 | 405                   | 4.20      | 34         | 48            | 422      | 3.89      | 30         | 54            | 1.37     | 0.170    |
| Using hounds to hunt bears   | 394                   | 3.18      | 23         | 65            | 416      | 2.78      | 18         | 71            | 1.79     | 0.074    |
| Bear baiting                 | 408                   | 2.65      | 16         | 71            | 433      | 2.17      | 11         | 77            | 2.44     | 0.015    |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve. Approval is represented by the selection of a value greater than 5.0, whereas disapproval is represented by the selection of a value less than 5.0 on the response scale.

<sup>b</sup> Sample sizes vary greatly due to the use of statistical weighting procedures.

latter comparison, the mean value of 5.10 would suggest that rural residents tended toward ambivalence. However, 48% of respondents in this category expressed approval, whereas 38% expressed disapproval, resulting in a mean close to the midpoint. This illustration again highlights the importance of avoiding sole reliance on mean levels of response to interpret attitudes toward these predator management practices. Results for comparisons across levels of geographic location based on bear hunting and using hounds to hunt bears did not differ statistically.

**Gender.** Women more strongly disapproved of all predator management practices under consideration than men (Table 3). Mean levels of response for men and women were below the scale midpoint in all cases, and average levels of approval were particularly low in response to the practices of bear baiting and using hounds to hunt black

bears. Only 9% of women approved of bear baiting, compared to 16% of men. In fact, even the practice that gained the most approval, cougar hunting, was approved by only 29% of women and 45% of men.

**Education.** Consistent with previously discussed results, mean values for both groups of respondents were below 5.0 for all practices. Those with greater levels of education expressed more disapproval for the selected predator management practices than their less educated counterparts (Table 4). Over 50% of those with a college degree expressed disapproval for cougar hunting, compared to 44% of those with little or no college education. Similarly, 58% of the respondents who had a college degree disapproved of bear hunting, compared to 49% of those without such a degree. Slightly greater percentages of respondents in both education categories selected a value below 5.0, representing disapproval, for using hounds to hunt

Table 3. Utah public attitudes toward selected predator management practices across levels of gender, 1998.

| Practice <sup>a</sup>        | Gender                |           |            |               |          |           |            |               | <i>t</i> | <i>P</i> |
|------------------------------|-----------------------|-----------|------------|---------------|----------|-----------|------------|---------------|----------|----------|
|                              | Male                  |           |            |               | Female   |           |            |               |          |          |
|                              | <i>n</i> <sup>b</sup> | $\bar{x}$ | % Approval | % Disapproval | <i>n</i> | $\bar{x}$ | % Approval | % Disapproval |          |          |
| Cougar hunting               | 919                   | 4.95      | 45         | 39            | 860      | 3.98      | 29         | 54            | 6.44     | <0.001   |
| Using hounds to hunt cougars | 911                   | 4.18      | 35         | 53            | 840      | 2.93      | 16         | 68            | 8.02     | <0.001   |
| Bear hunting                 | 914                   | 4.43      | 37         | 46            | 861      | 3.61      | 26         | 58            | 5.42     | <0.001   |
| Using hounds to hunt bears   | 903                   | 3.25      | 27         | 66            | 844      | 2.61      | 12         | 72            | 4.46     | <0.001   |
| Bear baiting                 | 925                   | 2.54      | 16         | 79            | 889      | 2.12      | 9          | 84            | 3.33     | 0.001    |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve. Approval is represented by the selection of a value greater than 5.0, whereas disapproval is represented by the selection of a value less than 5.0 on the response scale.

<sup>b</sup> Sample sizes vary greatly due to the use of statistical weighting procedures.

Table 4. Utah public attitudes toward selected predator management practices across levels of education, 1998.

| Practice <sup>a</sup>        | Education            |           |            |               |                |           |            |               | t    | P      |
|------------------------------|----------------------|-----------|------------|---------------|----------------|-----------|------------|---------------|------|--------|
|                              | Little or No College |           |            |               | College Degree |           |            |               |      |        |
|                              | n <sup>b</sup>       | $\bar{x}$ | % Approval | % Disapproval | n              | $\bar{x}$ | % Approval | % Disapproval |      |        |
| Cougar hunting               | 1210                 | 4.70      | 40         | 44            | 565            | 4.07      | 32         | 51            | 3.86 | <0.001 |
| Using hounds to hunt cougars | 1192                 | 3.89      | 29         | 56            | 555            | 2.93      | 19         | 68            | 5.86 | <0.001 |
| Bear hunting                 | 1213                 | 4.21      | 34         | 49            | 556            | 3.66      | 27         | 58            | 3.39 | 0.001  |
| Using hounds to hunt bears   | 1193                 | 3.19      | 22         | 65            | 549            | 2.41      | 15         | 76            | 5.31 | <0.001 |
| Bear baiting                 | 1238                 | 2.45      | 13         | 73            | 572            | 2.09      | 10         | 79            | 2.75 | 0.006  |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve. Approval is represented by the selection of a value greater than 5.0, whereas disapproval is represented by the selection of a value less than 5.0 on the response scale.

<sup>b</sup> Sample sizes vary greatly due to the use of statistical weighting procedures.

cougars, and even greater levels of disapproval were expressed for using hounds to hunt bears. Finally, only 10% of those with a college degree, and 13% of those with less education, approved of the practice of bear baiting.

**Age.** Based on mean levels of response, all age categories tended toward disapproval of the predator management practices in question (Table 5). While there were no significant differences for the cougar hunting variable, all other practices were associated with differences in mean levels of response by age. Somewhat surprisingly, respondents in the under-25 category tended to express less disapproval than all of the other groups. As an illustration, 83% of those in the 55-64 category and

80% of those 65 and older disapproved of using hounds to hunt bears, compared to only 62% of respondents under 25 (Table 6). Similarly, 38% of this latter age group approved of bear hunting, whereas only 25% of those in the 55-64 age group did so.

**Duration of residence.** Mean levels of response toward cougar hunting, using hounds to hunt cougars, and using hounds to hunt bears differed significantly across levels of duration of residence (Table 7). Respondents who had lived in Utah for more than 10 years tended to express less disapproval toward the practices than relative newcomers to the state. For example, 53% of newer residents, compared to only 45% of longtime residents,

Table 5. Mean levels of response by the Utah public for items representing attitudes toward selected predator management practices across levels of age, 1998.

| Practice <sup>a</sup>        | Age            |                        |       |           |       |           |       |           |       |           |     |           | F                 |
|------------------------------|----------------|------------------------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-----|-----------|-------------------|
|                              | Under 25       |                        | 25-34 |           | 35-44 |           | 45-54 |           | 55-64 |           | 65+ |           |                   |
|                              | n <sup>b</sup> | $\bar{x}$ <sup>c</sup> | n     | $\bar{x}$ | n     | $\bar{x}$ | n     | $\bar{x}$ | n     | $\bar{x}$ | n   | $\bar{x}$ |                   |
| Cougar hunting               | 292            | 4.80 A                 | 398   | 4.45 A    | 382   | 4.33 A    | 281   | 4.61 A    | 216   | 4.15 A    | 209 | 4.60 A    | 1.32 <sup>d</sup> |
| Using hounds to hunt cougars | 270            | 4.37 A                 | 396   | 3.47 B    | 373   | 3.67 AB   | 271   | 3.30 B    | 223   | 3.07 B    | 219 | 3.51 AB   | 4.70*             |
| Bear hunting                 | 284            | 4.44 A                 | 396   | 4.18 AB   | 380   | 4.22 AB   | 273   | 3.68 AB   | 225   | 3.56 B    | 215 | 3.82 AB   | 3.23 <sup>e</sup> |
| Using hounds to hunt bears   | 267            | 3.72 A                 | 391   | 3.26 AB   | 378   | 3.21 AB   | 275   | 2.62 BC   | 222   | 2.00 C    | 212 | 2.31 C    | 12.00*            |
| Bear baiting                 | 290            | 2.94 A                 | 403   | 2.56 AB   | 380   | 2.45 AB   | 283   | 2.11 BC   | 228   | 1.61 C    | 229 | 1.96 BC   | 8.19*             |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

<sup>b</sup> Sample sizes vary greatly due to the use of statistical weighting procedures.

<sup>c</sup> Means with different letters differ statistically ( $P < 0.05$ , Tamhane's post hoc test for pairwise comparisons).

<sup>d</sup>  $P = 0.251$ .

<sup>e</sup>  $P = 0.007$ .

\*  $P < 0.001$ .



Table 6. Distribution of responses by the Utah public to items representing attitudes toward selected predator management practices across levels of age, 1998. <sup>a</sup>

| Practice <sup>b</sup>        | Age      |     |       |     |       |     |       |     |       |     |     |     |
|------------------------------|----------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-----|-----|
|                              | Under 25 |     | 25-34 |     | 35-44 |     | 45-54 |     | 55-64 |     | 65+ |     |
|                              | % A      | % D | % A   | % D | % A   | % D | % A   | % D | % A   | % D | % A | % D |
| Cougar hunting               | 38       | 41  | 39    | 46  | 33    | 49  | 38    | 46  | 36    | 51  | 41  | 45  |
| Using hounds to hunt cougars | 33       | 47  | 25    | 61  | 25    | 57  | 25    | 65  | 20    | 70  | 24  | 65  |
| Bear hunting                 | 38       | 50  | 34    | 52  | 31    | 47  | 32    | 55  | 25    | 55  | 29  | 59  |
| Using hounds to hunt bears   | 29       | 62  | 21    | 63  | 21    | 63  | 17    | 72  | 10    | 83  | 16  | 80  |
| Bear baiting                 | 17       | 68  | 14    | 71  | 12    | 74  | 10    | 78  | 6     | 84  | 11  | 83  |

<sup>a</sup> Distribution is displayed as percentages of respondents in each of the following 2 categories: A = Approval, D = Disapproval. Approval is represented by the selection of a value greater than 5.0, whereas disapproval is represented by the selection of a value less than 5.0 on the response scale.

<sup>b</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

disapproved of cougar hunting. Seventy-one percent of those who had lived in Utah for a maximum of 10 years disapproved of using hounds to hunt cougars, whereas 58% of longtime residents approved. Finally, 74% of newcomers expressed some level of disapproval toward using hounds to hunt bears, compared to 67% of respondents who had lived in the state for more than 10 years.

**Stakeholder group.** We found statistical differences across categories of the stakeholder group variable for all predator management practices of interest to this study (Table 8). Post hoc tests indicated that hunters differed significantly from all other stakeholder groups in terms of mean levels of response toward the practices. Not surprisingly,

hunters tended to express less disapproval than other categories of respondents. For the practice of using hounds to hunt cougars, nonconsumptive users expressed significantly higher mean levels of disapproval than the other stakeholder groups. Similarly, nonconsumptive users expressed the highest levels of disapproval for bear baiting, with 83% of respondents in this group selecting a value below 5 on the 0 to 10 response scale (Table 9). While results were not definitive across all dependent variables, it was clear relative to the practice of bear baiting that nonconsumptive users tended to express more disapproval than nonparticipants with low levels of interest in wildlife who in turn expressed more disapproval than hunters.

**Multivariate relationships**

Multiple regression results indicated that only 8–19% of the variance in attitudes toward the selected predator management practices was explained by the complex of independent variables. The significant predictors of attitudes toward cougar hunting ( $R^2=0.15, P\leq 0.001$ ) were education, geographic location, and participation in hunting (Table 10). Individuals with little or no college

Table 7. Utah public attitudes toward selected predator management practices across levels of duration of residence, 1998.

| Practice <sup>a</sup>        | Duration of residence |           |            |               |                       |           |            |               | t     | P      |
|------------------------------|-----------------------|-----------|------------|---------------|-----------------------|-----------|------------|---------------|-------|--------|
|                              | 10 Years or Less      |           |            |               | Greater than 10 Years |           |            |               |       |        |
|                              | n <sup>b</sup>        | $\bar{x}$ | % Approval | % Disapproval | n                     | $\bar{x}$ | % Approval | % Disapproval |       |        |
| Cougar hunting               | 322                   | 3.99      | 32         | 53            | 1,446                 | 4.60      | 38         | 45            | -3.05 | 0.002  |
| Using hounds to hunt cougars | 297                   | 2.70      | 17         | 71            | 1,442                 | 3.76      | 27         | 58            | -5.60 | <0.001 |
| Bear hunting                 | 318                   | 3.77      | 26         | 56            | 1,448                 | 4.09      | 33         | 51            | -1.63 | 0.102  |
| Using hounds to hunt bears   | 306                   | 2.59      | 14         | 74            | 1,433                 | 3.02      | 21         | 67            | -2.37 | 0.018  |
| Bear baiting                 | 315                   | 2.25      | 12         | 79            | 1,492                 | 2.36      | 12         | 74            | -0.61 | 0.540  |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve. Approval is represented by the selection of a value greater than 5.0, whereas disapproval is represented by the selection of a value less than 5.0 on the response scale.

<sup>b</sup> Sample sizes vary greatly due to the use of statistical weighting procedures.

Table 8. Mean levels of response by the Utah public for items representing attitudes toward selected predator management practices across stakeholder groups, 1998.

| Practice <sup>b</sup>        | Stakeholder group |                        |         |           |                      |           |   |           |                                   |           | F      |
|------------------------------|-------------------|------------------------|---------|-----------|----------------------|-----------|---|-----------|-----------------------------------|-----------|--------|
|                              | Hunters           |                        | Anglers |           | Nonconsumptive Users |           | Nonparticipants with high interest <sup>a</sup> |           | Nonparticipants with low interest |           |        |
|                              | n <sup>c</sup>    | $\bar{x}$ <sup>d</sup> | n       | $\bar{x}$ | n                    | $\bar{x}$ | n   | $\bar{x}$ | n                                 | $\bar{x}$ |        |
| Cougar hunting               | 401               | 6.61 A                 | 398     | 3.83 B    | 642                  | 3.70 B    | 145   | 3.79 B    | 238                               | 3.87 B    | 68.80* |
| Using hounds to hunt cougars | 407               | 5.95 A                 | 379     | 3.15 B    | 636                  | 2.53 C    | 147   | 2.91 B    | 228                               | 2.83 B    | 86.81* |
| Bear hunting                 | 409               | 6.09 A                 | 392     | 3.22 B    | 647                  | 3.23 B    | 145   | 3.48 B    | 231                               | 3.78 B    | 67.81* |
| Using hounds to hunt bears   | 396               | 4.71 A                 | 386     | 2.56 B    | 635                  | 2.08 B    | 145   | 2.69 B    | 230                               | 2.51 B    | 54.66* |
| Bear baiting                 | 414               | 3.43 A                 | 395     | 2.10 BC   | 662                  | 1.66 B    | 149   | 2.26 BC   | 239                               | 2.23 C    | 29.37* |

<sup>a</sup> Nonparticipants were divided into 2 categories, those with high interest and those with low interest in wildlife, based their responses to a question asking them to rate their overall level of interest in wildlife on a scale ranging from 0 (no interest) to 10 (more interest in wildlife than in anything else).

<sup>b</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

<sup>c</sup> Sample sizes vary greatly due to the use of statistical weighting procedures.

<sup>d</sup> Means with different letters differ statistically ( $P < 0.05$ , Tamhane's post hoc test for pairwise comparisons).

\* $P < 0.001$ .

education, those living in rural areas, and hunters tended to express less disapproval toward cougar hunting.

Predictors of attitudes toward using hounds to hunt cougars ( $R^2=0.19, P<0.001$ ) included all independent variables of interest to this study except

that representing the angler stakeholder group. Nonhunters were more disapproving than hunters, nonconsumptive users expressed more disapproval than those who did not participate in nonconsumptive forms of recreation, and respondents with a college degree and relative newcomers to Utah

were more likely than their counterparts to disapprove of using hounds to hunt cougars. In contrast, rural-area residents, men, and younger respondents were the least disapproving of the practice.

The following characteristics were predictive of attitudes toward bear hunting ( $R^2 = 0.14, P \leq 0.001$ ): age and participation in hunting, fishing, and nonconsumptive forms of wildlife-related recreation (Table 11). Participation in hunting and younger age were associated with lower levels of disapproval, whereas fishing and nonconsumptive recreation were tied to higher levels. The

Table 9. Distribution of responses by the Utah public to items representing attitudes toward selected predator management practices across stakeholder groups, 1998.<sup>a</sup>

| Practice <sup>c</sup>        | Stakeholder group |     |         |     |                       |     |  |     |                                    |     |
|------------------------------|-------------------|-----|---------|-----|-----------------------|-----|--|-----|------------------------------------|-----|
|                              | Hunters           |     | Anglers |     | Non-consumptive users |     | Non-participants with high interest <sup>b</sup> |     | Non-participants with low interest |     |
|                              | % A               | % D | % A     | % D | % A                   | % D | % A  | % D | % A                                | % D |
| Cougar hunting               | 66                | 19  | 28      | 57  | 26                    | 57  | 34   | 55  | 31                                 | 52  |
| Using hounds to hunt cougars | 57                | 31  | 20      | 63  | 13                    | 74  | 16   | 67  | 14                                 | 70  |
| Bear hunting                 | 57                | 25  | 23      | 62  | 22                    | 63  | 24   | 65  | 30                                 | 50  |
| Using hounds to hunt bears   | 44                | 48  | 16      | 71  | 9                     | 80  | 19   | 74  | 12                                 | 72  |
| Bear baiting                 | 22                | 64  | 11      | 78  | 6                     | 83  | 12   | 73  | 10                                 | 75  |

<sup>a</sup> Distribution is displayed as percentages of respondents in each of the following 2 categories: A = Approval, D = Disapproval. Approval is represented by the selection of a value greater than 5.0, whereas disapproval is represented by the selection of a value less than 5.0 on the response scale.

<sup>b</sup> Nonparticipants were divided into 2 categories, those with high interest and those with low interest in wildlife, based on their responses to a question asking them to rate their overall level of interest in wildlife on a scale ranging from 0 (no interest) to 10 (more interest in wildlife than in anything else).

<sup>c</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

Table 10. Multiple regression analysis results for models aimed at predicting attitudes toward selected cougar management practices, from a 1998 survey of the Utah public.<sup>a</sup>

| Independent variable                            | Unstandardized coefficient ( <i>b</i> ) | SE    | Standardized coefficient ( <i>B</i> ) | <i>P</i> |
|---|---|-------|---------------------------------------|----------|
| <b>Cougar hunting model<sup>b</sup></b>         |   |       |                                       |          |
| Nonparticipant (constant)                       | 5.979                                   | 0.604 |                                       | < 0.001  |
| Hunter  | 2.336                                   | 0.232 | 0.304                                 | < 0.001  |
| Angler  | -0.248                                  | 0.222 | -0.032                                | 0.265    |
| Nonconsumptive user                             | -0.285                                  | 0.199 | -0.042                                | 0.153    |
| Education                                       | -0.444                                  | 0.157 | -0.064                                | 0.005    |
| Duration of residence                           | 0.288                                   | 0.192 | 0.034                                 | 0.133    |
| Geographic location                             | -0.782                                  | 0.172 | -0.101                                | < 0.001  |
| Gender  | -0.281                                  | 0.156 | -0.044                                | 0.071    |
| Age   | 0.004                                   | 0.047 | 0.002                                 | 0.926    |
| <b>Hounds to hunt cougars model<sup>c</sup></b> |   |       |                                       |          |
| Nonparticipant (constant)                       | 5.074                                   | 0.622 |                                       | < 0.001  |
| Hunter  | 2.474                                   | 0.236 | 0.314                                 | < 0.001  |
| Angler  | -0.020                                  | 0.229 | -0.087                                | 0.931    |
| Nonconsumptive user                             | -0.415                                  | 0.204 | -0.059                                | 0.042    |
| Education                                       | -0.702                                  | 0.160 | -0.098                                | < 0.001  |
| Duration of residence                           | 0.777                                   | 0.202 | 0.087                                 | < 0.001  |
| Geographic location                             | -0.708                                  | 0.176 | -0.088                                | < 0.001  |
| Gender  | -0.507                                  | 0.160 | -0.076                                | 0.002    |
| Age   | -0.120                                  | 0.047 | -0.057                                | 0.012    |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

<sup>b</sup>  $R^2 = 0.145$ ; adjusted  $R^2 = 0.141$ ;  $F_{8, 1749} = 37.11$ ;  $MSE = 330.17, 8.90$ ;  $P < 0.001$ .

<sup>c</sup>  $R^2 = 0.186$ ; adjusted  $R^2 = 0.182$ ;  $F_{8, 1721} = 49.11$ ;  $MSE = 447.34, 9.11$ ;  $P < 0.001$ .

regression coefficients for the hunter and nonconsumptive user classifications, as well as the age, education, and geographic location variables, were statistically significant in the model to predict attitudes toward using hounds to hunt bears ( $R^2 = 0.14$ ,  $P \leq 0.001$ ). As with the other regressions, results relative to the direction of relationships were similar to those obtained in the bivariate analyses. Finally, hunting, participation in nonconsumptive wildlife-related recreation, geographic location, and age were predictors of attitudes toward bear baiting ( $R^2 = 0.08$ ,  $P \leq 0.001$ ).

## Discussion

In addition to probing the attitudes of Utah residents toward predator management practices, we also examined various theoretical relationships that might aid in building a model to predict attitudes toward those practices. More specifically, the hypothesized model contained the following predictors: geographic location (i.e., urban versus rural residence), gender, age, educational attainment,

duration of residence in the state, and stakeholder group (i.e., a classification scheme based on participation in wildlife-related recreation activities). These characteristics have been identified frequently in the literature pertaining to attitudes toward wildlife and wildlife-related issues (e.g., Kellert 1976, Kellert 1984, Kellert and Berry 1987, Richards and Krannich 1991, Hooper 1994, Fulton et al. 1995, Lohr et al. 1996, Manfredi et al. 1997, Brooks et al. 1999, Zinn and Andelt 1999). However, based on empirical evidence from attitudinal research (e.g., Ajzen and Fishbein 1980, Donnelly and Vaske 1995), our expectation was that these variables would not have a strong, direct impact on attitudes toward predator manage-

ment. Our research confirmed this expectation in that the complex of independent variables considered here generally left most of the variation in attitudes toward each of the selected predator management practices unexplained. As an illustration, amount of explained variance in each of the attitudinal measures given by regression analyses ranged from 8 to 19%.

These findings indicate a need for additional research to uncover other, more important antecedents of attitudes toward predator management. We recommend that those interested in such an endeavor consider an examination of more relevant predictor variables such as those identified by attitude theory. As an example, the Theory of Reasoned Action (Ajzen and Fishbein 1980) would suggest that beliefs about the outcomes of predator management practices and the evaluation of those outcomes would be much better predictors of attitudes than sociodemographic variables. Similarly, wildlife value orientations (e.g., Fulton et al. 1996) would be worth examining in the context of this model aimed at predicting attitudes toward predator management practices.

Table 11. Multiple regression analysis results for models aimed at predicting attitudes toward selected black bear management practices, from a 1998 survey of the Utah public.<sup>a</sup>

| Independent variable                          | Unstandardized coefficient (b) | SE    | Standardized coefficient (B) | P       |
|---|--------------------------------|-------|------------------------------|---------|
| <b>Bear hunting model<sup>b</sup></b>         |                                |       |                              |         |
| Nonparticipant (constant)                     | 5.067                          | 0.603 |                              | < 0.001 |
| Hunter  | 2.083                          | 0.231 | 0.275                        | < 0.001 |
| Angler  | -0.701                         | 0.224 | -0.090                       | 0.002   |
| Nonconsumptive user                           | -0.609                         | 0.201 | -0.091                       | 0.002   |
| Education                                     | -0.293                         | 0.157 | -0.042                       | 0.063   |
| Duration of residence                         | 0.118                          | 0.193 | 0.014                        | 0.542   |
| Geographic location                           | -0.267                         | 0.172 | -0.035                       | 0.120   |
| Gender  | -0.106                         | 0.156 | -0.017                       | 0.497   |
| Age   | -0.104                         | 0.047 | -0.052                       | 0.026   |
| <b>Hounds to hunt bears model<sup>c</sup></b> |                                |       |                              |         |
| Nonparticipant (constant)                     | 4.481                          | 0.582 |                              | < 0.001 |
| Hunter  | 1.775                          | 0.223 | 0.244                        | < 0.001 |
| Angler  | -0.265                         | 0.214 | -0.036                       | 0.217   |
| Nonconsumptive user                           | -0.526                         | 0.192 | -0.083                       | 0.006   |
| Education                                     | -0.518                         | 0.151 | -0.079                       | 0.001   |
| Duration of residence                         | 0.362                          | 0.187 | 0.045                        | 0.053   |
| Geographic location                           | -0.367                         | 0.166 | -0.050                       | 0.027   |
| Gender  | -0.053                         | 0.150 | -0.009                       | 0.726   |
| Age   | -0.287                         | 0.045 | -0.150                       | < 0.001 |
| <b>Bear baiting model<sup>d</sup></b>         |                                |       |                              |         |
| Nonparticipant (constant)                     | 4.050                          | 0.527 |                              | < 0.001 |
| Hunter  | 0.900                          | 0.202 | 0.139                        | < 0.001 |
| Angler  | -0.380                         | 0.195 | -0.057                       | 0.051   |
| Nonconsumptive user                           | -0.643                         | 0.173 | -0.113                       | < 0.001 |
| Education                                     | -0.187                         | 0.136 | -0.032                       | 0.171   |
| Duration of residence                         | 0.121                          | 0.171 | 0.017                        | 0.480   |
| Geographic location                           | -0.472                         | 0.150 | -0.072                       | 0.002   |
| Gender  | -0.036                         | 0.137 | -0.007                       | 0.791   |
| Age   | -0.210                         | 0.040 | -0.124                       | < 0.001 |

<sup>a</sup> Variables representing attitudes toward selected predator management practices were coded on a scale ranging from 0 = strongly disapprove to 10 = strongly approve.

<sup>b</sup>  $R^2 = 0.136$ ; adjusted  $R^2 = 0.132$ ;  $F_{8, 1747} = 34.49$ ; M SE = 306.75, 8.89;  $P < 0.001$ .

<sup>c</sup>  $R^2 = 0.135$ ; adjusted  $R^2 = 0.131$ ;  $F_{8, 1719} = 33.56$ ; M SE = 271.07, 8.08;  $P < 0.001$ .

<sup>d</sup>  $R^2 = 0.076$ ; adjusted  $R^2 = 0.072$ ;  $F_{8, 1787} = 18.31$ ; M SE = 126.21, 6.89;  $P < 0.001$ .

Despite the lack of explained variance associated with prediction, results indicate that Utah residents' attitudes toward the 5 predator management practices examined here are significantly influenced, in a statistical sense, by sociodemographic and stakeholder group classifications. This would suggest that, while these selected predictor variables do not have a strong impact on attitudes, their identification may still be useful in the context of creating an overall predictive model. Relative to the hypothesized direction of significant relationships, except for age, results tend to confirm initial expectations and therefore support evidence in the

literature on wildlife-related attitudes. For example, urban residents tended to be more opposed than their rural counterparts to predator management practices outlined in this study. Men expressed less opposition than women to all of the management practices. Additionally, as anticipated, respondents with lower levels of educational attainment and longtime residents of the state were less opposed to predator management practices outlined in this study.

Results based on the age variable were somewhat different from what we expected. In most comparisons, the younger age groups, particularly the under-25 category, expressed the least amount of opposition. While empirical evidence is lacking, this pattern could reflect a greater tendency among the younger age groups to get involved in traditional forms of wildlife-related recreation, such as hunting, which could be more physically and time restrictive for older age

groups, and which could contribute to more positive attitudes toward traditional management practices such as predator control. Somewhat consistent with this notion, Utah hunters were indeed much less opposed, on average, than other stakeholder groups to the practices examined in this study. In fact, the hunter group was the only one that exhibited some form of approval, although slight, for some of the practices. While our data did not indicate that there was a significantly greater percentage of hunters in the youngest age group to explain a greater tendency toward approval, this possibility should not be ruled out because we

asked only about actual (as opposed to intended) participation in hunting over the last 3 years (a relatively short time frame). In any event, because our reasoning is not fully validated, further research would be useful in determining why the younger age groups were unexpectedly more supportive of the predator management practices examined in this study. An understanding of younger respondents' overall beliefs about predator management, which are the direct antecedents to the attitudes that we identified (Ajzen and Fishbein 1980), would likely prove especially useful toward this end.

On average, the Utah public expressed disapproval for the predator management practices we studied. While several of the mean values seemed to suggest trends toward ambivalence (i.e., because they were close to the neutral point of the scale), these values should not be used as the sole indicators of attitudes. The reason for this is that bimodal (and in some cases trimodal) response distributions were evident with many of the indicators used in this study. In other words, because responses tended to cluster around both of the extreme ends of the 0–10 scale for several of the attitudinal items, it would not be wise to rely greatly on a mean that may not account for that tendency. Despite our inability to draw clear conclusions from mean values, examining frequency distributions for each item confirmed the finding that most Utahns expressed very little approval for predator management.

### *Implications for wildlife management*

Policy-makers should not ignore the fact that a large percentage of Utah's population appears to disapprove of many traditional forms of predator management. Findings suggest that the steadily emerging "protectionist" paradigm (Pacelle 1998), exemplified in the wave of ballot initiatives banning such practices as bear baiting across the nation, may not only be firmly established now in the general population of Utah but may even be present among hunters and other traditionally supportive groups. This may indicate a need to revise existing policy or incorporate such public sentiment into future predator management policy decisions to avoid the risk of unsuccessful implementation of practices like those outlined in this study. In other words, because the success of many traditional wildlife management strategies is increasingly based on public approval, it is risky for wildlife resource agencies to ignore public sentiment, par-

ticularly when it is expressed in the form of opposition.

At the same time, the results indicate varying degrees of opposition among portions of the population, with levels of approval (i.e., only expressed by hunters) and disapproval differentiated by stakeholder group affiliation and sociodemographic attributes. Understanding differences among stakeholder groups and among segments of the population that are differentiated by social and demographic characteristics in attitudes toward predator management issues may be helpful to wildlife managers. By determining which groups approve of particular management practices or, in the case of our findings, which groups express less opposition, and which ones express more, agency personnel may be in a better position to decide where public education efforts should be directed. Given limited fiscal resources among most state wildlife management agencies for such programs, this concentration of resources to provide greater efficiency may be desirable. As an example, if policy-makers feel that particular predator management practices are necessary but find that certain groups are more likely to be in opposition than others, they may be able to address some of the concerns and alleviate some of the controversy surrounding these issues (presumably before policy is implemented) by using that information to guide public involvement and public education efforts.

On the other hand, this information may prove more useful in recognizing which traditional management practices are no longer appropriate. In other words, if most members of the general population oppose particular forms of predator management, as was the finding in this study, managers may be better served to pursue other, more acceptable practices. While this is not to say that approval should be the driving force in the selection of appropriate management strategies, it is something that must be considered along with such aspects as technique effectiveness, cost, etc. And if most members of the public are opposed to certain practices, education alone is likely to prove ineffective. Thus, these findings indicate the need to at least consider and research other options for predator management.

Future research should additionally focus on considering under what circumstances the practices examined in this study would potentially be deemed more acceptable by members of the general public. While we found that most Utahns were

generally opposed to such practices as bear baiting, this does not suggest that bear baiting is inappropriate in all situations. For example, it may in fact be more acceptable if applied in the fall as opposed to the spring, when cubs are present. Additionally, it may be viewed as more appropriate if used in areas where bears are known to have entered zones of human habitation (e.g., seeking food or garbage), where they may be seen as more of a threat to human safety. These examples underscore the importance of measuring levels of public acceptability in the specific context of how the practices will likely be used. Further research on this topic of context, particularly with respect to predator management, would prove useful in that it would enable managers to determine in what situations they may still be able to implement practices that are not generally acceptable to most stakeholders.

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