

This article was downloaded by: [University of Wisconsin - Madison]

On: 09 October 2011, At: 17:03

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Society & Natural Resources

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/usnr20>

Hunters as Stewards of Wolves in Wisconsin and the Northern Rocky Mountains, USA

Adrian Treves^a & Kerry A. Martin^b

^a Nelson Institute for Environmental Studies, University of Wisconsin-Madison, Madison, Wisconsin, USA

^b Department of Zoology, University of Wisconsin-Madison, Madison, Wisconsin, USA

Available online: 29 Aug 2011

To cite this article: Adrian Treves & Kerry A. Martin (2011): Hunters as Stewards of Wolves in Wisconsin and the Northern Rocky Mountains, USA, *Society & Natural Resources*, 24:9, 984-994

To link to this article: <http://dx.doi.org/10.1080/08941920.2011.559654>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Hunters as Stewards of Wolves in Wisconsin and the Northern Rocky Mountains, USA

ADRIAN TREVES

Nelson Institute for Environmental Studies, University of Wisconsin–Madison, Madison, Wisconsin, USA

KERRY A. MARTIN

Department of Zoology, University of Wisconsin–Madison, Madison, Wisconsin, USA

Regulated hunting may help conserve wildlife. Advocates argue hunters will champion conservation and generate revenue for management, regulation will promote sustained, stable wildlife populations, and conflicts with game species will diminish. Applying this notion to predators such as the wolf presents difficulties because of widespread human intolerance for the species. We assessed potential hunter stewardship of wolves by measuring attitudes of hunters and nonhunters in three surveys spanning 2001–2007 among 2,320 residents of four states in wolf range. Two U.S. states implemented hunting and several more are contemplating it, all as part of long-term wolf conservation. At the time of our surveys, majorities supported hypothetical wolf hunting depending on the justifications used. Likely wolf hunters showed little inclination to conserve wolves. However some predict such attitudes might change if they were allowed to hunt wolves.

Keywords animal damage, attitudes, *Canis lupus*, harvest, human–wildlife conflict, interventions, tolerance

Hunters have been credited with helping to conserve game animals and habitat in many countries (Holsman 2000; Jackson 1996; Loveridge et al. 2007). Therefore, advocates are also proposing regulated hunting to support the conservation of large carnivores such as wolves (*Canis lupus*) and grizzly bears (*Ursus arctos*) (Linnell et al. 2001; Heberlein 2008; Mincher 2002). Yet skeptics may view hunting as anticonservation (Kellert 1978; Rutberg 2001), and scientific scrutiny of it as a conservation strategy has raised numerous unanswered questions about carnivore hunting specifically (Treves 2009; Loveridge et al. 2007). This debate resonates with disagreements over the value of an individual animal's life, the human role in nature, and the effectiveness of lethal and nonlethal management of wildlife (Treves and Naughton-Treves 2005; Naughton-Treves et al. 2003; Bekoff 2001).

Received 22 September 2009; accepted 10 July 2010.

We thank Lisa Naughton for help at every stage and Janelle Holden and Tory Shelley for support with research design and data interpretation. Jeremy Bruskotter improved the article.

Address correspondence to Adrian Treves, Nelson Institute for Environmental Studies, University of Wisconsin–Madison, 30A Science Hall, 550 North Park Street, Madison, WI 53706, USA. E-mail: atreves@wisc.edu

Advocates promise that hunters will champion carnivore conservation, provide revenue for management, control growing carnivore populations, or reduce their attacks on domestic animals. For the purpose of this article we operationalized the first clause (championing carnivore conservation) with measures of certain attitudes (tolerance for carnivores or acceptance of carnivore policy once they become game animals) and certain intentions (financial contributions, willingness to kill a wolf illegally, and adherence to regulations of a hunt). These attitudes and intentions are part but not all of those attributed to hunters who steward wildlife. For example, Holsman (2000) proposed that hunter-stewards should support

wildlife management program goals designed to meet a balance of social values including optimal (rather than maximum) production of game species, a diversity of recreational opportunities, and control of nuisance wildlife species [and] broader ecological objectives arising from concern for loss of biodiversity. (Holsman 2000, 810)

We operationalized Holsman's synthesis to test hunter inclination to stewardship of wolves before a wolf hunt was implemented. We measured attitudes among 2,320 residents within and adjacent to wolf range in two surveys conducted in Wisconsin (WI 2001 and WI 2004) and one conducted in the northern Rocky Mountain states of Idaho, Montana, and Wyoming (NRM 2007) (Table 1). We compared the attitudes and reported behaviors of nonhunters and hunters, as well as those of hunters of carnivores and hunters of other game. Our focus on attitudes and reported behaviors conforms to three decades of research on wildlife value orientations (Kellert 1978; 1985; Bright and Manfredo 1996) and the broader field of environmental values (Manfredo and Dayer 2004; Rauwald and Moore 2002). In brief, surveys probing individual responses to local environmental issues can reliably reveal respondents' attitudes and underlying value orientations, and often correlate to intentions and perhaps future behaviors (Ajzen 1991). Those data can in turn provide insight into the acceptability of policy and the likelihood that individuals in the aggregate follow or thwart regulations (reviewed in Rauwald and Moore 2002).

In addition, our focus on wolves is timely and salient to the debate over hunting as a conservation strategy. First, we consider ours a stringent test of the assumption of hunter tolerance because wolves are among the least tolerated carnivores on the planet. For example, in 1944 the Buddhist Regent of the Dalai Lama, Tadrags (Taktra) Rinpoche, decreed "the village heads, officials and governors of all districts of Tibet are commanded to prevent the killing of all animals, except predatory hyenas and wolves" (Norbu 1992, 1). In places as different as Mongolia, Japan, India, Scandinavia, and the United States, wolves are feared for their rare attacks on people and resented for more common predation of domestic animals and perceived competition for game animals (Knight 2003; Kaczensky et al. 2008; Montag et al. 2003; Linnell and Bjerke 2002; Rajpurohit 1998; Zabel and Holm-Muller 2008; Treves et al. 2002). Second, our focus is timely because state and tribal authorities have begun grappling with how to manage wolves after the federal government declared them recovered (U.S. Fish and Wildlife Service 2009). Two states implemented public, regulated wolf hunts in 2009, and three more are discussing hunting as a long-term conservation strategy (Yardley 2009; Treves 2008; Wydeven et al. 2009a). Thus we offer these data to inform policy, which will influence how wolves and other carnivores will be managed and tolerated in mixed-use landscapes worldwide.

Table 1. Design of three surveys of residents of Wisconsin (WI) and Northern Rocky Mountains (NRM) during 2001–2007

Parameter	WI 2001	WI 2004	NRM 2007
Target population	All WI residents with ≥ 1 verified wolf attack on a farm animal or bear hunting dog (115), randomly selected residents of the same counties (312), members of the WI Bear Hunters' Association (101), and anonymous (7)	Residents ^a selected randomly from six WI ZIP codes evenly distributed by rural/urban; within/adjacent to wolf range; and low to high contributions to the WI Endangered Resources Fund	Residents ^a of ZIP codes within or adjacent to known wolf packs from three states; equal representation of each sex
Number of respondents	535	1364	421
Response rate, %	81.6	61.7	42.7
Length, pages	15	7	4
Incentive	\$1	\$2	\$2
Mailings	One with one reminder	One with one reminder	Two with two reminders

^aSurvey Sampling International LLC, Fairfield, CT.

Methods

Between 2000 and 2007, a period of intense public debate over federal listing and public hunting of wolves (Nie 2003; Treves 2008), we interviewed representatives of key regional interest groups (livestock producers, hunters, agencies, conservation groups) to formulate our survey questions. The three self-administered, mail-back questionnaires targeted different populations for different purposes (Table 1). WI 2001 was aimed at understanding whether compensation was associated with greater tolerance for wolves among recipients and nonrecipients matched for occupation or exposure to wolves (Naughton-Treves et al. 2003). WI 2004 was aimed at understanding financial contributions to wolf conservation among randomly selected state residents across a broad cross section of the state (Treves et al. 2009). NRM 2007 was aimed at randomly selected people living in wolf and grizzly bear range in the year preceding federal delisting. In addition to cover letters explaining the goal of surveying attitudes to wolf policy in a given state, WI 2001 and WI 2004 were entitled "Wolf Management In Wisconsin [Year] Public Opinion Survey," and the NRM 2007 questionnaire stated, "This survey is intended for residents of ID, MT, and WY to voice their opinion of future grizzly and wolf management in their states."

A nationwide telephone interview survey screened 821 Wisconsin households to locate those with members who had participated in hunting in 2005 (defined from

Table 2. Attitudes to a hypothetical wolf hunt among residents of wolf-range states, with question: “Should there be a public hunting/trapping season on wolves?”

Options (choose one)	Responses (%)											
	WI 2001			WI 2004			NRM 2007					
	Overall, <i>n</i> = 535	Men, <i>n</i> = 435	Women, <i>n</i> = 100	Overall, <i>n</i> = 1284	Men, <i>n</i> = 913	Women, <i>n</i> = 346	Overall, <i>n</i> = 421	Men, <i>n</i> = 239	Women, <i>n</i> = 182			
Yes, immediately	32.8	37.2	16.0	15.6	18.7	6.9	46.4	55.2	34.4			
Only when managers estimate the population can sustain harvests ^a	36.4	38.1	31.0	38.2	41.7	29.8	34.2	33.0	37.2			
Only if a majority of the public votes that damages have become intolerable ^b	19.3	17.3	27.0	29.8	28.2	34.4	7.3	4.5	9.8			
No, never	11.5	7.4	26.0	16.4	11.4	28.9	12.1	7.3	18.6			

^aWI surveys: “Yes as soon as biologists think the wolf population can sustain annual harvests.”^bWI surveys: “Yes, but only when depredations become unmanageable.”

12-month recall by one household member; U.S. Department of the Interior Fish and Wildlife Service [DOI] and U.S. Department of Commerce [DOC] 2006). Hunters by that definition represented ~14% of residents. Importantly the authors noted that “[the 2006 survey] does not tell us how many . . . hunters . . . there were because many do not participate every year” (U.S. DOI and U.S. DOC 2006, 2). We were interested in the attitudes of people who were recent or regular hunters, not just participants in the previous year. Therefore, we defined hunters as those who responded “Yes” to either “Have you hunted within the past 2 years?” or “Have you regularly hunted at any other time in your life?” Our definition may inflate the apparent numbers of hunters in WI 2001 (71.2%) and WI 2004 (58.3%). These high proportions reflect several other factors: deliberate oversampling of bear hunters in the WI 2001 survey, possible disproportionate hunter interest in our topic, respondents’ interpretations of “regularly,” and behind it all the widespread tradition of hunting in the state—particularly the northern third. We surmise that our definition of hunter was liberal because our NRM 2007 sample contained 67.4% hunters defined as just described, but only 48.2% when defined by a separate question asked only in NRM 2007: “Do you consider yourself . . . a hunter [48.2%], not a hunter but not opposed to hunting [47.5%], or opposed to hunting [4.3%]?” We also asked what respondents hunted, to distinguish carnivore hunters from other hunters.

We lacked resources to assess nonresponse bias, so probably undersampled neutral responses, as in other wildlife attitude surveys (Decker et al. 2006). From this standpoint our NRM 2007 survey should be viewed cautiously because fewer than half the mailed surveys were returned despite reminders and cash incentives (Table 1).

We used several questions developed by others (Montag et al. 2003; Kellert 1985), and repeated some of our own in succeeding surveys (Naughton-Treves et al. 2003). Our final questionnaires conformed to many recommendations in the literature on length, salience, and question order (Dillman 2007), with one exception. The three affirmative responses to a wolf hunt (Table 2) were treated as “endorsement.” These preceded the last option “No, never” in the survey instrument, leading to possible acquiescence bias (the tendency for neutral respondents to respond positively) and order effects (the tendency to choose the first in a series of options because of haste or distraction), which might inflate endorsement of a wolf hunt (Dillman 2007; Smyth et al. 2006). We were able to assess and dismiss both biases by comparison with a similar “choose-all-that-apply” question in NRM 2007 (see Results section). Copies of surveys are available from the authors.

We used JMP 8 statistical software (SAS Institute, Inc. 2009) with $\alpha = .05$. For brevity, we report 5-level Likert-scaled variables as *agree*, *neutral*, or *disagree* but contingency tests used all levels; hence $df = 4$.

Results

Overall, a majority of respondents endorsed a wolf hunt either immediately or conditionally, whereas <16.5% opposed it unconditionally (Table 2). Our samples were biased toward male heads of household, as are most surveys that use commercial mailing lists. Segregating responses by sex did not change our conclusions. Although women more often chose “No, never” than did men ($\chi^2 > 16$, $df = 3$, $p < .001$ in all three tests), majorities of women in every survey still endorsed a wolf hunt (Table 2).

Many respondents who endorsed a wolf hunt for one reason would disagree with those who endorsed it for other reasons. Indeed, all but one of the already-mentioned majorities eroded when considering single justifications or goals for a

Table 3. Attitudes to a hypothetical wolf-hunt among hunters and non-hunters in wolf-range states, with question: “Should there be a public hunting/trapping season on wolves?”

Options (choose one)	Responses (%)								
	WI 2001		WI 2004			NRM 2007			
	Nonhunters, n = 154	All hunters, n = 381	Bear hunters, n = 198	Nonhunters, n = 517	All hunters, n = 723	Carnivore hunters, ^c n = 300	Nonhunters, n = 148	All hunters, n = 273	Wolf or bear hunters, n = 76
Yes, immediately	11.4	41.0	59.6	5.6	22.5	33.3	25.0	56.4	74.7
Only when managers estimate the population can sustain harvests ^a	35.0	37.0	30.5	30.6	43.3	43.3	38.2	32.6	20.0
Only if a majority of the public votes that damages have become intolerable ^b	29.3	15.7	7.3	38.7	23.5	18.7	11.8	5.1	1.3
No, never	24.3	6.3	2.6	25.1	10.7	4.7	25.0	5.9	4.0

^aWI surveys: “Yes as soon as biologists think the wolf population can sustain annual harvests.”

^bWI surveys: “Yes, but only when depredations become unmanageable.”

^cIncludes bears, coyotes, bobcats, and other fur-bearers.

wolf hunt individually (Table 2). The sole majority emerging for a single response, "Yes immediately," was from men in NRM 2007. Another question in WI 2004 invoked a single goal, "A program that uses hunting by the public as a way to control the numbers of wolves," which 47.7% endorsed.

However, overall majorities emerged in both of the WI surveys if one summed responses to options 1 ("immediately") and 2 ("if sustainable"), or options 2 and 3 ("only when conflicts become unmanageable/intolerable"), which were not necessarily mutually exclusive (Table 2). The popularity of hunts designed with two goals was corroborated when 57.7% ($n = 535$) of WI 2001 respondents agreed with a different statement, "If there are enough wolves, I think we should allow some of them to be killed for their fur." Only 29% of women agreed with the latter statement, whereas 65% of men did ($\chi^2 = 57$, $df = 4$, $p < .0001$).

We ran a nominal logistic regression comparing attitudes with two predictors (hunter and sex). Hunters by our definition had significantly different attitudes to a wolf hunt than did others, and in WI 2004 sex was significant as well (sample sizes in Tables 2 and 3, $df = 3$; WI 2001 hunters $\chi^2 = 35.1$, $p < .0001$; sex $\chi^2 = 7.0$, $p = .07$; WI 2004 hunters $\chi^2 = 82.1$, $p < .0001$; sex $\chi^2 = 21.3$, $p < .0001$; NRM 2007 hunters $\chi^2 = 27.6$, $p < .0001$; sex $\chi^2 = 2.3$, $p = .13$). The interaction term (hunter \times sex) was never significant in any of our surveys (so we dropped it out of each model).

Carnivore hunters in WI 2001 and NRM 2007 endorsed an immediate wolf hunt in higher proportions than other hunters (Table 3). By contrast, a plurality of WI 2004 hunters (and carnivore hunters) chose option 2 relating to sustainability of a wolf hunt. The latter, larger sample was more diverse than the other two surveys because it included hunters who lived further from wolf population range and also hunters of small and large carnivores (Table 3). We conducted a post hoc test to determine whether hunters living outside of wolf range were less inclined to support an immediate wolf hunt (Karlsson and Sjostrom 2007). Only 6.5% of 245 hunters living adjacent to wolf range endorsed an immediate wolf hunt, compared to 30.2% of 472 hunters living within wolf range in WI 2004 ($\chi^2 = 76.6$, $df = 4$, $p < .0001$). Carnivore hunters and hunters within wolf range were more ready to hunt wolves sooner. We infer these are likely future wolf hunters in WI.

In NRM 2007 we presented hypothetical rules for wolf hunting. Hunters endorsed fewer restrictions in five of nine comparisons with nonhunters (Table 4). Wolf or bear hunters opposed three restrictions more strongly than other hunters: "Hunting only individuals that caused property damage," "No hunting with dogs," and "No hunting with traps or bait." A plurality of all hunters and a majority of wolf or bear hunters "would oppose any restrictions on hunting" (Table 4).

The check-all-that-apply format of the question in Table 4 provided a means to assess acquiescence bias and order effects in our prior question about a wolf hunt (Table 2). Overall, 12.1% chose "No, never" (Table 2) and 13.1% chose "I would oppose any hunting of wolves" (Table 4). Therefore, our main question showed no evidence of acquiescence bias.

During our surveys, federal and state protection of wolves as a nongame species was widely publicized (Treves 2008). Hunters would also be reminded of nongame protections when applying for permits every season (Wisconsin Department of Natural Resources [WDNR] 2005; 2008). We measured agreement with two statements: "If I were hunting deer and saw a wolf, I might shoot it" (WI 2001) and "If I were out hunting and saw a wolf, I might shoot it" (WI 2004). Overall, 10.8% ($n = 511$) and 10.9% ($n = 1,317$) agreed with the statements, respectively. In

Table 4. Response to hypothetical wolf-hunting rules among residents of wolf-range in the Northern Rocky Mountains with question: “If a public hunting season were planned for wolves, which rules would you support?”

Options (check all that apply)	Nonhunters (%) <i>n</i> = 136	Hunters (%) <i>n</i> = 281	Wolf/bear hunters (%) <i>n</i> = 76	Comparison
I would oppose all hunting of wolves	25.0	7.5***	6.6	<i>a</i>
Hunting only individuals that caused property damage	19.9	13.9	5.3*	<i>a</i>
No hunting of breeding females	23.5	13.2*	9.2	<i>a</i>
No hunting with traps or bait	38.2	25.3**	15.8*	<i>a</i>
No hunting with dogs	31.6	21.7*	10.5**	<i>a</i>
No hunting allowed on public lands	7.4	5.0	1.3	NS
Hunting every other year or less often	14.0	8.9	5.3	NS
Hunting by state residents only	29.4	32.4	31.6	NS
I would oppose any restrictions on hunting wolves	16.9	39.9***	55.3**	<i>a</i>

Note. Fisher’s exact test is used for comparison, with NS indicating not significant.

^aSignificant results reflect the contrast between an asterisked value and the one to its left: *.05 > *p* > .01, **.01 ≥ *p* > .001, ****p* ≤ .001.

WI 2001, 14.8% of 189 bear hunters agreed, compared to 8.4% of 322 other hunters ($\chi^2 = 28.3$, *df* = 4, *p* < .0001). In WI 2004, 15.8% of 303 carnivore hunters agreed compared to 9.7% of 1,014 other hunters ($\chi^2 = 38.6$, *df* = 4, *p* < .0001).

In WI 2001 and WI 2004 we asked respondents how many wolves there should be in the state, using the statements, “WI’s wolf population has grown from 25 animals in 1980 to approximately [250 and 348 wolves in 2001 and 2004, respectively]. In your opinion the wolf population should be kept below . . .” Because the wolf population grew over time, the values in brackets changed between surveys. Respondents were offered four values ranging from 100 to 500 plus “no cap” (WI 2001), or a range of 250–1000 and “no cap” (WI 2004). Hunters wanted significantly fewer wolves in WI than did nonhunters ($\chi^2 > 38.8$, *df* = 4, *p* < .0001 in both surveys). In WI 2001 and WI 2004, 85% and 51% of hunters, respectively, wanted the wolf population kept below the state management target of 350 (Wydeven et al. 2009b). Carnivore hunters wanted fewer wolves than did other hunters ($\chi^2 > 52.2$, *df* = 4, *p* < .0001 in both tests). Similarly, a majority (60.3%) of wolf or bear hunters in NRM 2007 were “opposed to wolf conservation” versus 45.1% for hunters overall ($\chi^2 = 11.1$, *df* = 2, *p* = .004).

WI 2004 hunters reported contributing money to the Endangered Resources Fund, which finances the state management of wolves and other threatened and

endangered species (Treves et al. 2009), at rates similar to those of nonhunters (18.4% and 21.1%, respectively, Fisher's exact test, $p = .26$). Hunters who endorsed a wolf hunt for any of the three reasons in Table 3 were half as likely (16.0%) to report contributing, as were the 69 hunters who opposed a wolf hunt (35.0%: Fisher's, $p < .0001$). Those who endorsed an immediate wolf hunt were the least likely (5%, $n = 148$) to report contributing ($\chi^2 = 71.1$, $df = 3$, $p < .0001$).

Discussion

We found support for a regulated, public hunting season on wolves in four range states of the United States among men, women, hunters, and nonhunters, albeit with important stipulations about the justification for such a hunt. Our findings undermine claims that nonhunters will oppose hunting (Rutberg 2001) and support instead the idea that nonhunters endorse hunting to remedy conflicts (Ericsson et al. 2004). Perhaps the nonhunters in our sample felt that wolf damages to property violated the rules of coexistence and thereby warranted retaliation. Policymakers should seek to understand the nuances of attitudes among the general public and among those living within carnivore range if they wish to conserve large carnivores and balance human needs. In general, we recommend wildlife policies that align with both utilitarian and preservation values, if decision makers seek broader public support.

Our three surveys did not support the assumption that hunters would steward wolves. We found the majority of hunters unsupportive of wolf conservation at the time of our surveys. Depending on which survey one considers, the hunters we sampled reported attitudes to hunting rules, wolf population levels, and sustainability inconsistent with Holsman's (2000) synthesis of hunter stewardship. Likely future wolf hunters in our Wisconsin surveys also reported inclinations (wolf poaching) and past behaviors (contribution to wolf management) unsupportive of wolf conservation. Holsman (2000) concluded similarly, "[U.S.] hunters often hold attitudes and engage in behaviors that are not supportive of broad-based, ecological objectives" (813). However, hunter attitudes might change following participation in planning or pursuing a wolf hunt. Prior research suggests individual attitudes take time to change—on the order of years, if not generations—but we have no longitudinal studies of change in individual attitudes in response to wolf policy changes (Bruskotter et al. 2007; Manfredo et al. 2003; Heberlein and Ericsson 2005; Majić and Bath 2010). In sum, governments cannot assume hunters will support the conservation of wolves simply because they did so in the past for other game (Holsman 2000; Loveridge et al. 2007).

References

- Ajzen, I. 1991. The theory of planned behavior. *Organizational Behav. Hum. Decision Processes* 50:179–211.
- Bekoff, M. 2001. Human-carnivore interactions: Adopting practices for complex problems. In *Conservation biology 5: Carnivore conservation*, ed. J. Gittleman, S. Funk, D. MacDonald, and R. Wayne, 179–195. Cambridge, UK: Cambridge University Press.
- Bright, A. D., and M. J. Manfredo. 1996. A conceptual model of attitudes toward natural resource issues: A case study of wolf reintroduction. *Hum. Dimens. Wildl.* 1(1):1–21.
- Bruskotter, J. T., R. H. Schmidt, and T. L. Teel. 2007. Are attitudes toward wolves changing? A case study in Utah. *Biol. Conserv.* 139:211–218.

- Decker, D. J., C. A. Jacobson, and T. L. Brown. 2006. Situation-specific “impact dependency” as a determinant of management acceptability: Insights from wolf and grizzly bear management in Alaska. *Wildl. Soc. Bull.* 34(2):426–432.
- Dillman, D. A. 2007. *Mail and Internet surveys: The tailored designed method*. New York: John Wiley & Sons.
- Ericsson, G., T. A. Heberlein, J. Karlsson, A. Bjärvall, and A. Lundvall. 2004. Support for hunting as a means of wolf *Canis lupus* population control in Sweden. *Wildl. Biol.* 10(4):269–276.
- Heberlein, T. A. 2008. Heberlein: Yes to Wisconsin wolf hunt [Editorial]. *Wisc. State J.* 14 September. http://host.madison.com/news/opinion/editorial/article_ffb7b1b1-b0d7-5b2c-a848-24bf2fe60d7c.html
- Heberlein, T. A., and G. Ericsson. 2005. Ties to the countryside: Accounting for urbanites attitudes toward hunting, wolves, and wildlife. *Hum. Dimens. Wildl.* 10:213–227.
- Holsman, R. H. 2000. Goodwill hunting? Exploring the role of hunters as ecosystem stewards. *Wildl. Soc. Bull.* 28(4):808–816.
- Jackson, J. J. 1996. An international perspective on hunting. In *Tourist hunting in Tanzania*, ed. N. Leader-Williams, J. A. Kayera, and G. L. Overton, 7–11. Cambridge, UK: International Union for the Conservation of Nature and Natural Resources, Occasional Publication 14.
- Kaczensky, P., N. Enkhsaikhan, O. Ganbaatar, and C. Walzer. 2008. The Great Gobi B Strictly Protected Area in Mongolia—Refuge or sink for wolves *Canis lupus* in the Gobi? *Wildl. Biol.* 14:444–456.
- Karlsson, K., and M. Sjoström. 2007. Human attitudes towards wolves, a matter of distance. *Biol. Conserv.* 137(4):610–616.
- Kellert, S. R. 1978. *Attitudes and characteristics of hunters and anti-hunters and related policy suggestions*. Paper read at Hunter Safety Conference, Charleston, SC, 24 January.
- Kellert, S. R. 1985. Public perceptions of predators, particularly the wolf and coyote. *Biol. Conserv.* 31:167–189.
- Knight, J. 2003. *Waiting for wolves in Japan*. Oxford, UK: Oxford University Press.
- Linnell, J. D. C., and T. Bjerke. 2002. Frykten for ulven. En tverrfaglig utredning [Fear of wolves: An interdisciplinary study]. *Norsk Inst. Naturforsk. Oppdragsmeld.* 722:1–110.
- Linnell, J. D. C., J. E. Swenson, and R. Andersen. 2001. Predators and people: Conservation of large carnivores is possible at high human densities if management policy is favorable. *Anim. Conserv.* 4:345–349.
- Loveridge, A. J., J. C. Reynolds, and E. J. Milner-Gulland. 2007. Does sport hunting benefit conservation? In *Key topics in conservation biology*, ed. D. W. Macdonald and K. Service, 224–241. Oxford, UK: Oxford University Press.
- Majić, A., and A. Bath. 2010. Changes in attitudes toward wolves in Croatia. *Biol. Conserv.* 143:255–260.
- Manfredo, M. J., and A. A. Dayer. 2004. Concepts for exploring the social aspects of human–wildlife conflict in a global context. *Hum. Dimens. Wildl.* 9:317–328.
- Manfredo, M. J., T. L. Teel, and A. D. Bright. 2003. Why are public values toward wildlife changing? *Hum. Dimens. Wildl.* 8:287–306.
- Mincher, B. J. 2002. Harvest as a component of Greater Yellowstone Ecosystem grizzly bear management. *Wildl. Soc. Bull.* 30(4):1287–1292.
- Montag, J., M. E. Patterson, and B. Sutton. 2003. *Political & social viability of predator compensation programs in the West. Final project report*. Missoula: School of Forestry, University of Montana.
- Naughton-Treves, L., R. Grossberg, and A. Treves. 2003. Paying for tolerance: The impact of livestock depredation and compensation payments on rural citizens’ attitudes toward wolves. *Conserv. Biol.* 17:1500–1511.
- Nie, M. 2003. *Beyond wolves: The politics of wolf recovery and management*. Minneapolis: University of Minnesota Press.
- Norbu, J. 1992. *Tibet: Environment and development issues*. Wildlife conservation decree issued by Tagdra Rinpoche the Regent of Tibet in 1944. DIIR CTA, the Official website of the

- Central Tibetan Administration, <http://www.phayul.com/news/article.aspx?id=26164> (accessed 20 January 2011).
- Rajpurohit, K. S. 1998. Child lifting wolves in Hazaribagh, India. *Ambio* 28:163–166.
- Rauwald, K. S., and C. F. Moore. 2002. Environmental attitudes as predictors of policy support across three countries. *Environ. Behav.* 34(6):709–739.
- Rutberg, A. T. 2001. Why state agencies should not advocate hunting or trapping. *Hum. Dimens. Wildl.* 6:33–37.
- SAS Institute, Inc. 2011. *JMP 9 statistical software*. Cary, NC: SAS Institute, Inc.
- Smyth, J., D. Dillman, L. Christian, and M. Stern. 2006. Comparing check-all and forced-choice question formats in web surveys. *Public Opin. Q.* 70(1):66–77.
- Treves, A. 2008. Beyond recovery: Wisconsin's wolf policy 1980–2008. *Hum. Dimens. Wildl.* 13(5):329–338.
- Treves, A. 2009. Hunting to conserve large carnivores. *J. Appl. Ecol.* 46:1350–1356.
- Treves, A., R. R. Jurewicz, L. Naughton-Treves, and D. Wilcove. 2009. The price of tolerance: Wolf damage payments after recovery. *Biodivers. Conserv.* 18(14):4003–4021.
- Treves, A., R. L. Jurewicz, L. Naughton-Treves, R. A. Rose, R. C. Willging, and A. P. Wydeven. 2002. Wolf depredation on domestic animals: Control and compensation in Wisconsin, 1976–2000. *Wildl. Soc. Bull.* 30:231–241.
- Treves, A., and L. Naughton-Treves. 2005. Evaluating lethal control in the management of human-wildlife conflict. In *People and wildlife, conflict or coexistence?* ed. R. Woodroffe, S. Thirgood, and A. Rabinowitz, 86–106. Cambridge, UK: Cambridge University Press.
- U. S. Department of the Interior, Fish and Wildlife Service, and U. S. Department of Commerce. 2006. *National survey of fishing, hunting, and wildlife-associated recreation: Wisconsin*. Washington, DC: U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau.
- U.S. Fish and Wildlife Service. 2009. Final rule to identify the western great lakes populations of gray wolves as a distinct population segment; Final rule to identify the northern rocky mountain population of gray wolf as a distinct population segment; And to revise the list of endangered and threatened wildlife. *Fed. Reg.* 74(62):15070–15123.
- Wisconsin Department of Natural Resources. 2005. *Wisconsin's fish & wildlife annual report 2004–2005*. PUB-CE-259 2006. Madison, WI: Wisconsin Department of Natural Resources.
- Wisconsin Department of Natural Resources. 2008. *DNR spring hearings on proposed wildlife and fisheries rules & annual Conservation Congress county meeting*. http://dnr.wi.gov/org/nrboard/congress/spring_hearings (accessed 13 August 2008).
- Wydeven, A. P., T. R. Van Deelen, and E. J. Heske. 2009a. Wolf recovery in the Great Lakes region: What have we learned and where will we go now? In *Recovery of gray wolves in the Great Lakes region of the United States: An endangered species success story*, ed. A. P. Wydeven, T. R. Van Deelen, and E. H. Heske, 331–338. New York: Springer.
- Wydeven, A. P., J. Wiedenhoft, R. N. Schultz, R. P. Thiel, R. R. Jurewicz, B. Kohn, T. R. Van Deelen. 2009b. History, population growth and management of wolves in Wisconsin. In *Recovery of gray wolves in the Great Lakes region of the United States: An endangered species success story*, ed. A. P. Wydeven, T. R. Van Deelen, and E. H. Heske, 87–106. New York: Springer.
- Yardley, W. 2009. Wolves aren't making it easy for Idaho hunters. *New York Times*, 10 September. <http://www.nytimes.com/2009/09/11/us/11wolves.html> (accessed 20 January 2011).
- Zabel, A., and K. Holm-Muller. 2008. Conservation performance payments for carnivore conservation in Sweden. *Conserv. Biol.* 22(2):247–251.