TO:	Senate Committee on Natural Resources and Wildfire Recovery
FROM:	Amaroq Weiss, Center for Biological Diversity Bethany Cotton, Cascadia Wildlands Danielle Moser, Oregon Wild
DATE:	April 6, 2021
RE:	SB 642 – Appropriating General Funds for the Wolf Management Compensation and Proactive Trust Fund ("Fund") – **Supplement to comments and testimony**.

Yesterday, the Center for Biological Diversity, Cascadia Wildlands and Oregon Wild, submitted written comments to this committee regarding SB 642, and a representative from the Center testified at yesterday's hearing. Our comment letter and testimony brought to your attention two key reasons we oppose SB 642 as written:

1) The Fund has not been implemented in a way that is transparent, with statewide consistency and adequate documentation, making it subject to abuse and badly in need of reform.
2) No attitude surveys have ever been conducted to determine if the Fund is achieving its intended result of improving social tolerance by livestock owners for coexisting with wolves.

We mentioned an investigative journalism piece by Oregon Public Broadcasting, which elaborated on the fundamental flaws of the Fund implementation. We also mentioned that, ideally, longitudinal surveys would have been conducted over time to evaluate the Fund's effectiveness.

We here provide, as attachments, the OPB investigative journalism piece on the Fund. We also provide a published peer-reviewed paper describing how longitudinal surveys were conducted in Wisconsin and the results of those surveys (in that instance, surveys were intended to assess whether allowing the public to kill wolves via state-sanctioned hunting seasons improved social tolerance for coexisting with wolves).

Thank you for your time and consideration of these issues. Please feel free to contact us with any questions or concerns. You can reach Amaroq Weiss at aweiss@biologicaldiversity.org, Bethany Cotton at bethany@cascwild.org, and Danielle Moser at dm@oregonwild.org.

https://www.opb.org/news/article/questionable-payments-oregon-ranchers-wolves-cattle/

Questionable Payments To Oregon Ranchers Who Blame Wolves For Missing Cattle

By Tony Schick (OPB)
Halfway, Oregon July 17, 2017 12 p.m.

Many western states pay livestock operators for cattle and sheep lost to wolves depredation. But an EarthFix investigation found Oregon is making questionable payments to ranchers.

Chad DelCurto parked his pickup beside the road winding the Snake River canyon, surveying the jagged green edge of Oregon where his cattle grazed. This is where he lost them.

There's ample feed and room to wander on these remote and rugged stretches of public land. But there's added risk to open range: harsh weather, disease, rustlers, predators.

"This is the reality — this is outside, all natural, grass-fattened beef," he said.

DelCurto dresses in denim from neck to ankle, with mud-splattered black on his boots and hat. He's been ranching all his life, and he's teaching his 9-year-old son to do the same.

Last year, DelCurto claimed he lost 41 calves and 11 cows out here in Baker County. Each calf could be worth over $700, the cows almost twice that.

He blames wolves. Alerts from state wildlife officials showed them in the area. He said the landscape showed some scat and tracks. And he could sense it in his cattle.

"You got up in there and tried to move them, could tell they'd been spooked," DelCurto said. "I can't prove it because there's no carcasses, but I know damn good and well the wolves had a big part in it."

So DelCurto filed for state-funded compensation for the losses, just as he did for nine missing cattle the year before.

But here's the issue: There hasn't been a confirmed wolf kill of livestock in Baker County since 2012. And according to state biologists, there are only three known resident wolves in the county. Given that, a wolf-related loss of that size, with no carcass to show, would be unheard of.

Despite all that, the Baker County wolf compensation board approved DelCurto's claim. That left one state official with the dilemma of whether to deny the rancher compensation or approve a loosely documented claim so large it would have decimated the state program's budget.

Ever since wolves' return in the West, states have experimented with some form of compensation for ranchers, with mixed results.

Since 2012, Oregon has kicked in money for ranchers to hire range riders and purchase radios and fence lining, called fladry, to deter wolves. The state has also compensated livestock operators for both confirmed or unconfirmed losses of cattle, sheep or working dogs. It's a well-regarded program that provides some relief for ranchers feeling the added strain of a returned predator: even some of the wolf-advocate groups who clash with ranchers say it was necessary.

But an EarthFix examination found the state has made a questionable pattern of payments that contradicts established knowledge of the state's wolf population.

The investigation also found state and county officials do not take all the necessary steps to confirm claims of missing livestock and ensure a limited money pool flows toward legitimate claims of wolf kills. That can mean less money to prevent wolf conflicts, and less money for documented losses.

With no consistent system for verifying unfound livestock losses, the state has little way of knowing for sure whether it's denying some ranchers their due compensation or paying out claims it shouldn't.

No biological explanation

Chart the payments year over year, and a pattern emerges.

Since 2012, payments for missing cattle have increased when actual confirmed losses did not. Experts say those rates should track together.

"There is no possible biological or ecological explanation for this," said Luigi Boitani, an international expert on wolves who reviewed the data. In 2010, the University of Rome professor uncovered problems with wolf compensation in his home country of Italy.

"Small variations are understandable but the huge variation in the last few years has no justification," Boitani said. "The rate of confirmed deaths and missing livestock should track together."

Roblyn Brown, acting wolf coordinator for the Oregon Department of Fish and Wildlife, had a similar assessment: “I don’t know of a biological explanation for why claims for missing livestock have gone up.”

Others, like the Oregon Department of Agriculture, which administers the compensation program, say the change could be attributed to awareness: more and more ranchers discovering and utilizing these compensation programs.

Map the payments and another pattern emerges that confounds wolf biologists.

Since 2012 the state of Oregon has paid a total of over $150,000 to compensate ranchers for over 380 missing cattle and sheep. All of it has gone to three Northeast Oregon counties: Wallowa, Umatilla, and Baker.

Umatilla and Wallowa have large known wolf populations, and a history of confirmed depredations. Baker County has little of either, yet ranchers there have received more money than anywhere else in the state, at $65,000.

Brown had no explanation for this, either.

“We would expect wolf-caused missing livestock to be more likely in areas where we have seen confirmed depredations, and have high wolf density,” Brown said.

In total, payments for livestock losses in Eastern Oregon have far surpassed what state officials had projected based on data from other states.

The government might not believe DelCurto’s numbers, but he doesn’t believe the government’s either.

An aerial view of land used for grazing in northeast Baker County, Oregon. Ranchers say the rough, forested terrain make it difficult to find missing or dead cattle.
Tony Schick, OPB / EarthFix

Needle in a haystack

He searched by horseback, trudging up ridges of snow. He searched by helicopter. Still, he couldn’t find his missing cattle.

“A foot of snow and you’re not cutting any tracks,” DelCurto said. “At that point, you start counting up and cutting your losses.”

He turned out about 350 head of cattle, including pregnant cows to give birth on the open range. DelCurto has done it many times. Usually, he said, more of them come back.

“That just doesn’t happen,” he said. “You don’t go to grass and have them die.”

Fellow ranchers near Halfway reported a combined 21 livestock missing that year they say were wolf-related.

There's a reason ranchers expect to be compensated for losses, even without proof wolves are to blame: You try finding a cow carcass in 10,000 acres of wilderness.

"It's just damn rugged and steep. Trying to find a corpse or something like that is like trying to find a needle in a haystack," DelCurto said.

If you could take the flight DelCurto did, you would see what he means.

It is not the open pasture you might picture for cattle ranching. An hour soaring over Northeast Baker County reveals miles of dense timber and canyons.

But even discovering the remains of a cow thought to have been preyed upon by wolves doesn't always mean much to cattlemen. Some no longer bother to report wolf kills to ODFW, they say, because they are unsatisfied with the response. Ranchers in Eastern Oregon have complained to the state that dead livestock investigations are too slow and allow the deterioration of evidence that could implicate wolves.

"We're losing it. You've lost a lot of it," Todd Nash of the Oregon Cattlemen's Association told ODFW commissioners at a meeting in May. "Most of these aren't called in in Wallowa County anymore. You have to backtrack into talking ranchers into participating again."

There are at least 112 wolves statewide, mostly scattered across Wallowa, Umatilla and Union counties further north. There's also a population further southwest, in the Klamath area.

The state's best data show three wolves known to be residing in Baker County.

DelCurto disagrees. So does his neighbor, Dean Tucker, the cow boss at Pine Valley Ranch in Halfway.

"When the Department of (Fish and) Wildlife tells the public there's only X number of wolves running around, they're full of s***," Tucker said.

Last year, Pine Valley Ranch reported five cattle missing because of wolves. The year before, it was seven.

"There's a hell of a lot more wolves than what they tell us," Tucker said.

Brian Ratliff, the local ODFW biologist, said the state's wolf population likely is higher than the official minimum estimates, but not by much. And there are wolves, like the Snake River Pack, for which the agency can only make educated guesses of their whereabouts.

He said his agency is almost surely under-counting the number of cattle and sheep killed by wolves, too, though he can't say by how many.

"You could not find 100 percent of livestock depredations. You could not do it," Ratliff said, referring to the forested landscapes where DelCurto and Tucker turn out cattle. "It's too broken, it's too rough."

In 2003, a research team from the U.S. Fish and Wildlife Service tackled the question of how many are missed. That often-cited study estimated for every livestock carcass you find killed by a wolf in rough country like this, there are seven more out there you don't find.

Baker County's payments fly in the face of that. For one proven depredation there, ranchers have been compensated for 85 missing cattle.

Other counties have much lower rates. In Umatilla County, the rate is just over one in seven. In Wallowa County, more cattle were confirmed dead from wolves than were claimed missing.

The case for compensation

Most Western states have some form of wolf compensation, an attempt to help ranchers with the added costs and stress from a predator they didn't want and felt was forced on them by people who don't bear the burden.

But payments for dead livestock don't cut it, many say.

Kelly Birkmaier, who ranches in Oregon's Wallowa County, said wolves have killed her cattle, injured them, spooked them and caused them to run through fences. The cost of all that adds up.

Harassment from wolves stresses cattle in ways that can reduce their weight gain or pregnancy rates, according to ranchers and others in the livestock industry. Beyond that, wolves can render cattle dogs useless, because cattle begin to associate them with wolves.

"Is this something we can keep doing? At this point in time, yes, it seems to still be working. But the added hardship and the added labor from the wolves make it challenging," Birkmaier said.

Ranchers take pride in their cattle, she said, and when something out of their control threatens that, "it is very hard, mentally, on you."

For many years, the pro-wolf group Defenders of Wildlife compensated ranchers for losses as an attempt to increase tolerance for the predators, said Suzanne Stone, the organization's Northwest representative. As wolves became more established, they stopped and states began creating their own, she said.

Idaho no longer compensates for missing livestock anymore, only for government-confirmed losses. When Idaho did compensate for missing livestock several years ago, its program was plagued by complaints about fraudulent claims.

“They would give compensation to their friends, sometimes they would compensate themselves,” said Stone, who is based in Boise, Idaho. “It was very loosely run. It would run out of money super quick, and people were only compensated for pennies on the dollar.”

Wyoming pays for missing cattle, but only if there’s also a confirmed kill. Using the ratio in the Fish and Wildlife study, Wyoming compensates for up to 7 missing cattle for each confirmed loss.

Washington recently began paying for indirect wolf losses, including missing animals, weight loss and reduced pregnancy rates. So far only two ranchers have used it since 2015. Its process is long and involved — each file for a livestock producer’s claim is over 50 pages of documentation. In Oregon, sometime’s it’s only two or three pages.

In Oregon, ranchers submit their claims through county boards, made up of county commissioners, ranchers, business members and wolf advocates.

When Oregon established its local-focused program, Stone said it had the potential to become the best in the country. The plan was to try it for a year or two, she said, and then re-evaluate to see if the right people are being compensated.

“I don’t think that the program’s been evaluated, at all,” she said. “And that really is an important step, so that you can make sure that it’s transparent, honest and sustainable.”

Questions over large claim

Last year, the claim from Baker County was so large it raised questions at the Department of Agriculture.

Mike Durgan sat on Baker County’s compensation board at the time, when it approved a request of payment for 73 missing animals — 52 of which were DelCurto’s. Durgan quit, fed up with the county’s lack of due diligence.

“Baker County’s was not believable,” he said. “It was baffling to me how we let that slide by.”

He said unverified claims discredit a good program for honest ranchers.

“Some of the most anger I got was from other ranchers,” he said. “They realize something like this impacts them in a negative way.”

After the state started raising questions, Durgan said the board simply asked for less money, rather than trying to find the right number. Ultimately, Baker County received a

total $16,125, still more than any other county. That included paying DelCurto for 12 missing cattle.

“I will say that the committee here, we started off with some missteps,” said Mark Bennett, a Baker County commissioner and rancher who sits on the compensation board.

Bennett said the county didn’t want to set a bar so high no rancher could clear it.

“We didn’t have a clear picture for our producers, what all was required,” Bennett said. “Some of them could come up with some really decent documentation, and some it was weak.”

Lapses in oversight

Across Oregon these requests are supposed to document ranchers used techniques to prevent wolf damage. They’re supposed to document that all other potential factors for the loss besides wolves have been ruled out.

State and county records show some do not, and the amount of evidence varies widely from claim to claim. Counties and ranchers are under no obligation to consult with ODFW, the state’s authority on wolf populations, about missing livestock.

Missing livestock compensation requests also rely extensively on documents detailing cattle counts at the start and end of grazing season, as well as estimates of historical losses. But the state has no standard for what evidence suffices, meaning not all ranchers are held to the same standard.

Claims that sailed through the process left one worker at the Department of Agriculture, Jason Barber, doing the job meant for several county compensation boards. In the past two years, Barber has raised questions about claims in Umatilla, Wallowa and Baker counties that were submitted without supporting documentation.

The result is a system with spotty evidence and large gray areas, meaning legitimate claims could be denied and questionable ones could be paid.

In one case, the state paid nearly $1,500 for a confirmed wolf kill, only to realize it wasn’t one more than a year later. The county was allowed to simply move the funds to the “missing livestock” category.

Last year, the state approved Wallowa County’s grant application despite the fact that its compensation board never met to approve the request. Under deadline, a county commissioner sent the application to ODA without going through the process required by statute.

Barber, director of Internal Services and Consumer Protection at the Department of Agriculture, said the agency is working to improve the program and plans to create a

checklist that counties can use "to make sure everything is kosher as far as what's in statute, what's in rule."

The state also has been unable to prove that ranchers are using the wolf-deterrent materials it's paid for ranchers to use, including fladry fence lining and radio boxes. The Agriculture Department didn't collect some counties' annual reports until EarthFix filed a public records request for them.

State-purchased fladry often sits in storage, as locals officials and ranchers say it is ineffective in the most problematic areas for wolf conflict.

To deter wolves, Baker County used the money to hire a range rider whom ranchers said they never saw. That left officials considering new ways to verify his time spent on the range.

Verifying the proper use of these funds has gained importance as wolves spread and more counties draw from the same pool of money — just over $210,000 this year. Already, the state has too little money to fund the requests it gets.

Based on trust

Dennis Sheehy saw this coming. The longtime rancher is the father of Oregon's compensation plan.

As the sun set over Wallowa County, the cows mooed and cold air crept in over the Diamond Prairie Ranch. Sheehy was just finishing a long day of branding, and was facing another one in the morning.

"All of this was thought about when we put it together," said Sheehy, who devised the first draft of the compensation plan with a fellow rancher in 2010. It was adopted by the Legislature a year later.

"What it's based on is trust within the livestock industry here," he said. "There may be some people that do or do not have the same set of integrity and honor, you might say, about that."

As for a claim of 41 calves, like DelCurto's? It all depends.

"That might be a little extreme, but then another guy that I really do trust, they lost 16 or 17," he said.

Wolves are not the biggest threat, Sheehy said. At least to his ranch, they're just another problem that takes incremental bites into his operation's bottom line, along with drought, weather and cattle prices.

A few years ago, prices spiked and Oregon's cattle industry surpassed $900 million in total value, making it the state's top agricultural industry. Prices have fallen since.

"You're going to see people going out of business," he said, if prices stay low, and predators are just one more thing to tip the scale.

"Low prices, you get the wolves eating on you, lose two or three calves, it could be a little more serious," he said.

Sheehy said compensation has done its job: Lessen the blow to ranchers. But wolf territory is expanding in Oregon, and Sheehy doubts state leaders would fund a statewide compensation program.

He now wonders what will become of what he started.

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Special Issue Article: Conservation Crime

Tolerance of wolves in Wisconsin: A mixed-methods examination of policy effects on attitudes and behavioral inclinations

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ABSTRACT

Numerous studies report majorities of survey respondents hold positive attitudes toward wolves. However, a 2001–2009 panel study found declining tolerance of wolves among residents of Wisconsin's wolf range. Poaching, believed to be increasing, has been an important source of mortality in Wisconsin's wolf population since the 1980s. We conducted focus groups, with an accompanying anonymous questionnaire survey of participants, among farmers and hunters in Wisconsin's wolf range to gain a more in-depth understanding of attitudes towards wolves and inclinations to poach wolves. Whereas our study was originally designed to examine the effects of an experimental lethal-control program on inclination to poach, oscillating wolf-management authority shifted our focus from a single intervention to a suite of changes in policy and management. Following federal delisting of the Western Great Lakes wolf population in January 2012, Wisconsin implemented lethal-depredation control and created the state's first legalized wolf-harvest season in October 2012. We convened focus groups before and after these changes. Pre- and post-survey results showed majorities of respondents held negative attitudes toward wolves with no decrease in inclination to poach, suggesting lethal-control measures, in the short term, may be ineffective for increasing tolerance. Participants expressed favorable attitudes toward lethal-control measures, but believed there were limitations in the implementation of the lethal-control measures. Focus group discussions revealed elements of positivity toward wolves not revealed by questionnaires, as well as several thematic areas, such as fear, empowerment, and trust, that may inform the development of interventions designed to increase tolerance of wolves and other controversial species.

1. Introduction

Understanding attitudes toward wolves and wolf management is important because they can predict how people may behave toward wolves and respond to wolf-management actions (Bruskotter et al., 2009). Numerous studies of attitudes towards wolves have been conducted since the first one published by Johnson (1974). Although summaries of this body of research are available (e.g., Williams et al., 2002), comparisons are difficult given a lack of measurement consistency (Vaske, 2008). Generally, these studies suggest that over the last four decades a majority of the general public has been positive toward wolves and wolf recovery. However, research has demonstrated that people who live near wolf packs are less positive towards wolves than people who live in areas without wolves (Ericsson and Heberlein, 2003; Ericsson et al., 2006; Karlsson and Sjöström, 2007). One criticism of surveys of attitudes toward wolves is that they are usually single cross-sectional surveys and hence insufficient to examine consistency of attitudes over time (Williams et al., 2002). Monitoring change in attitudes over time is of particular relevance in wolf management, given the high level of polarization and continuously evolving management landscape.

Research in Wisconsin examined change over time in the first known panel study of attitudes and beliefs regarding wolves (Treves et al., 2013). Mail surveys of residents of Wisconsin's wolf range were conducted in 2001 and 2004 and then respondents were resampled in 2009 (Treves et al., 2013). Results revealed a decline in tolerance of wolves, indicated by increases in fear of wolves, inclination (i.e., disposition rather than intention) to shoot a wolf illegally, perceived competition for deer, and support for lethal control of wolves (Treves et al., 2013). During the study period, Wisconsin's wolf population and the number of wolf depredations on domestic animals more than doubled, and there was a probable increase in the number of wolves killed illegally (Wydeven et al., 2011, 2012). Seeking ways "to increase social

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tolerance" the U.S. Fish and Wildlife Service (USFWS) issued a lethal control permit for depredating wolves, classified as an endangered species at the time, to the state of Wisconsin with the rationale that "in the absence of adequate measures to control known depredating wolves, public support for wolf recovery and wolf reintroduction programs will likely erode and individuals will resort to illegal killing to protect their pets and livelihood" (Humane Society of the United States v. Kempthorne, 2006). However, the Humane Society of the United States and other groups challenged this assertion in federal court, contending scientific evidence was lacking to support the defendant's position that a lethal depredation control program would positively influence the propagation or survival of the wolf by increasing social tolerance (Humane Society of the United States v. Kempthorne, 2006). The importance of this assumption goes beyond the particulars of that case because scholars and advocates for at least 15 years have predicted that poaching would decline if other forms of lethal management were legalized (Ericsson and Heberlein, 2003; Mincher, 2002; Heberlein, 2008) and even earlier if one considers the regulation of trophy hunting in Africa as an anti-poaching method (Du Toit, 2002; Lewis and Jackson, 2005; Packer et al., 2010; Whitman et al., 2004; Wilkie and Carpenter, 1999; Woodroffe and Frank, 2005). However we know of no satisfactory test of the idea that legalizing lethal control will reduce poaching (reviewed in Treves, 2009) and evidence for poaching in relation to quotas is equivocal (Andren et al., 2006).

To test the assumptions underlying the USFWS proposal, we coordinated with the USFWS and the Wisconsin Department of Natural Resources (WDNR) to conduct a pre/post study around the agencies' plans to implement an experimental lethal control program for wolves implicated in attacks on livestock. Specifically, we aimed to examine the potential influence of lethal depredation control of wolves on attitudes, beliefs, and behavioral inclinations of farmers and hunters with confirmed or perceived losses to wolves (livestock, hunting dogs, game), as these stakeholder groups were presumed to have the highest potential for interactions with wolves. However, changes in federal and state-level management policy altered the experimental conditions for our study (Fig. 1). First, the Western Great Lakes wolf population, which includes Wisconsin's wolves, was federally delisted on January 27, 2012 after we had collected the pre-intervention baseline data. Immediately afterwards, the WDNR began lethal control operations contracted with the U.S. Department of Agriculture (USDA–APHIS) to trap on land with frequent depredations and issued lethal control permits to landowners with confirmed depredations. Concurrently, state-level legislation passed as Act 169 on April 2, 2012, which permitted Wisconsin's first hunting and trapping season commencing on October 15 2012. During the wolf-hunt season we collected the post-intervention data (Fig. 1).

In this paper, we examine the assumption underlying proposed wolf management that lethal control of problem wolves will increase tolerance of wolves, thereby reducing the inclination to poach wolves. Simple before-and-after comparisons cannot explain the effects of a myriad of interwoven events (Treves and Bruskotter, 2014). Moreover, illegal take of wildlife is a complex phenomenon with varied motivations that may influence human behavior (Bell et al., 2007; Eliason, 1999; Muth and Bowe, 1998). Therefore, we sought an approach that would permit us to qualitatively and quantitatively compare attitudes, beliefs, and behavioral inclinations at a time of "no lethal control" (Time 1) to a time with "a range of lethal control" (Time 2). Specifically, our objectives were to: (1) obtain a more nuanced understanding of attitudes and beliefs regarding wolves and wolf management than previous surveys and (2) further explore the inclination to kill wolves illegally before and after policy changes that had the potential to affect the wolf population and local stakeholders. We demonstrate the capacity of mixed-methods research to reveal the complexity and nuance of attitudes toward wolves and wolf management and to produce genuine, candid dialogue about poaching and management actions intended to reduce poaching.

2. Methods

The strengths and limitations of individual research methods are important considerations in selecting the methods most appropriate for a particular study. The limitations of survey research, for instance, are widely discussed in the literature. Waterton and Wynne (1999, p. 131) argued that public opinion surveys of the nuclear industry provided a "misleadingly simple and superficial" picture of locals' attitudes, were unable to elucidate the social context in which they were typically expressed, and failed to explain what was meant by survey responses, such as when respondents agree or disagree with belief statements. We selected a mixed-methods (MM) approach to examine attitudes, beliefs, and behavioral inclinations (i.e. illegal take or poaching) before and after a suite of changes in wolf management. Mixed-methods research uses both quantitative and qualitative methods in the same study to collect and analyze data, integrate findings, and draw inferences (Tashakkori and Creswell, 2007). In combining two complementary methods, we were able to take advantage of the strengths of each method and address their limitations.

One qualitative method that has been used in environmental studies is the focus group, where a moderator leads a guided discussion among a small group of participants (approximately 5–10) selected for particular characteristics (Krueger and Casey, 2000). Focus groups have been used as a stand-alone method to examine mental constructs of biodiversity (Fischer and Young,

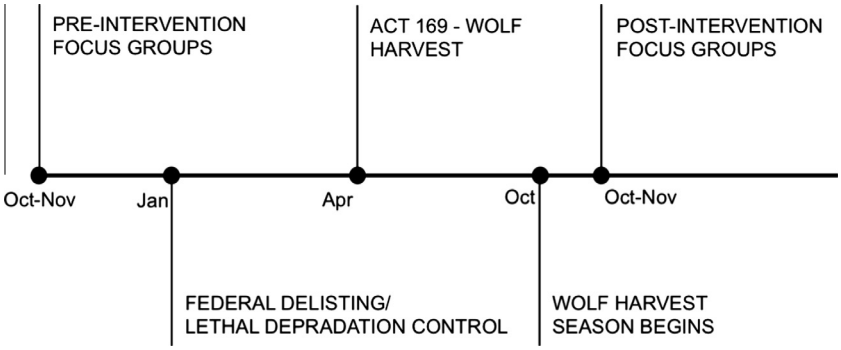

Fig. 1. Timeline of events during study period (October 2011 – November 2012).

2007), to learn about children's attitudes toward hunting (DiCamillo, 1995), and to explore beliefs underlying support or opposition of wildlife management methods (Dandy et al., 2012). They have also been used in combination with other methods such as individual interviews (Kaplowitz and Hoehn, 2001), key informant interviews (Mangun et al., 2007), and surveys (Kolinjivadi, 2012; Wutich et al., 2010) to examine perceptions of ecosystem services, perceptions of deer hunters, and water management concerns among decision makers. These studies found that focus groups used in concert with other methods revealed differing but complementary information.

Combining methods through an MM approach has been recommended for researching sensitive topics (Helitzer-Allen et al., 1994; Wutich et al., 2010). Sensitive topics in social science are diverse, but the core features are concerned with potential threats and costs to study participants (Lee and Renzetti, 1990). Though our objective was not to inquire about past behavior (i.e., poaching wolves), which would potentially put our study participants at risk for self-incrimination, we did want to discuss normative beliefs associated with this behavior. Focus groups can provide unique insight on sensitive topics (Morgan and Krueger, 1993; Kitzinger, 1995; Zeller, 1993). In a group setting, people with a common problem or who perceive themselves to be in the presence of others like themselves may be more likely to share attitudes, beliefs, and experiences (Morgan and Krueger, 1993; Wilkinson, 1999). However, research has demonstrated that respondents are more likely to report sensitive information in self-administered questionnaires than in interviews (Tourangeau and Yan, 2007) and when anonymity is provided (Ong and Weiss, 2000). Therefore, we selected complementary methods, utilizing the strengths of focus groups (e.g., social interaction) and a self-administered questionnaire survey (e.g., anonymity) to examine attitudes, beliefs, and behavioral inclinations regarding wolves and poaching. Permission to conduct this research was granted by the University of Wisconsin-Madison Institutional Review Board.

2.1. Participants

Focus groups were organized and convened by two of the authors, CBN (focus group moderator) and ZV (assistant). We identified individuals representing three stakeholder groups that had reported perceived and/or confirmed wolf damage in public meetings, directly to wildlife authorities, or in statewide public surveys regarding wolves: livestock owners (henceforth referred to as farmers), bear hunters, and deer hunters. Farmers and bear hunters who use dogs were selected from WDNR records of confirmed and probable wolf depredations. Recent surveys have found dissatisfaction among deer hunters with deer harvests (Heberlein, 2004; Jacques and Van Deelen, 2010), with some blaming predators, including wolves, for reduced hunter harvests (DelGiudice et al., 2009). We selected deer hunters by randomly choosing phone numbers from local telephone directories. We differentiated bear hunters and deer hunters to examine potential variation in attitudes based on differing types of experience with wolves (e.g., predation experience, hunting success). Time 1 and Time 2 participants were selected from the same lists. However, we were not able to confirm that all of the same individuals were in the pre/post groups, as we were not permitted to keep identifying information due to the potential for discussion of illegal behavior. All participants resided in Wisconsin's wolf range.

Using scripts specific to each stakeholder group, CBN and ZV recruited participants by telephone. Each script contained screening questions to make the groups as mutually exclusive as possible. Farmers and deer hunters were excluded if they were also bear hunters; deer hunters were excluded if they were also farmers or bear hunters; and bear hunters were excluded if they were also farmers. We believed that using deer hunting as a screen would have limited our potential participant pool to an unacceptably low level, so we included farmers and bear hunters who may have also been deer hunters. During the recruitment calls, we informed potential participants about the topics to be covered in discussions, confidentiality, a $25 token of appreciation for their participation, and a drawing for one $50 gift card at each session. We mailed confirmation letters containing entry tickets approximately two weeks before each session. We made reminder phone calls 1–2 days before each focus group session.

2.2. Instrument development

We developed the focus group discussion guide and the survey instrument concurrently, with input from human dimensions researchers at the WDNR and two universities as well as wolf program managers with the USFWS and the WDNR. The discussion guide was comprised of open-ended questions designed to encourage discussion and potential follow-up questions. The questioning route included: (a) opening comments, (b) questions regarding knowledge of and previous experience with wolves, (c) hypothetical scenarios, (d) normative questions regarding illegal killing of wolves, and (e) wolf management preferences.

The pre- and post-survey instruments were nearly identical, with additional questions on the Time 2 questionnaire pertaining to changes in wolf management policy. Both questionnaires were largely comprised of pre-tested questions from the Wisconsin panel study. We measured behavioral inclination with a single item that stated the current legal status of wolves in Wisconsin followed by the question: "Are there any situations where you might try to kill a wolf anyway?" Response choices were "yes," "no," and "don't know." If respondents responded in the affirmative, the next question asked "When?" with eight response choices: any wolf I encounter on my own, wolf did not run away from me when I was on foot, the wolf did not run away from my vehicle, the wolf was on my property, the wolf came too close to my home, the wolf approached my pet or farm animals, the wolf was in my deer management unit, or other. We measured attitude toward wolves with a single item that asked: How would you describe your general attitude toward wolves? We coded responses on a 7-point scale from "strongly dislike" (1) to "strongly like" (7), including a neutral midpoint (4). Two Time 2 items asked about beliefs regarding the influence of policy changes on tolerance of wolves. We coded responses on a five-point scale from "strongly disagree" (1) to "strongly agree" (5), with a neutral midpoint (3) and a "don't know" response option available outside the scale. Finally, we conducted a mock focus group comprised of student hunters on the University of Wisconsin campus to pilot the survey instrument and discussion guide.

We did not ask questions to assess knowledge and awareness of current wolf management and policy. However, we did clarify at the beginning of the Time 1 focus groups that it was illegal, at the time, to kill a wolf unless there is a threat to human health. At the beginning of each Time 2 group discussion, we reviewed the changes that had taken place during the previous year (i.e., federal delisting, lethal depredation control, wolf harvest season).

2.3. Data collection

We convened the Time 1 focus groups in February and March of 2011 and the Time 2 focus groups in October and November of 2012 in three geographically distinct sites within Wisconsin's wolf range: Central Forest, Northeast and Northwest. During each period, we conducted one focus group with each of the three stakeholder groups in each of the three regions. In doing this, we hoped to reach theoretical saturation, or the point where no new

information is collected (Krueger and Casey, 2000). Each group met in a hotel conference room where participants could feel comfortable and privacy could be maintained. Food and beverages were provided as a token of appreciation and to create a social atmosphere.

Due to the potential for conversation to turn to illegal behavior (poaching wolves), we took several steps to ensure confidentiality or anonymity, where possible, and cultivate a sense of trust. When participants arrived, we greeted them at the door and asked them not to reveal their real names. Each turned in their entry ticket and selected a name-tag with a pseudonym. Once "registered," participants received a copy of the informed consent and privacy policy. Following verbal agreement to participate (written consent would not have permitted anonymity), participants completed a questionnaire prior to the focus group discussion to mitigate the potential influence of the impending group discussion. This also allowed for potential reactivity, or increased salience, so that discussions would be more "informative and lively" (Zeller, 1993, p. 168). We did not include demographic questions in the questionnaire so as not to compromise anonymity. Late arrivals did not receive questionnaires.

The group discussion started when all sealed questionnaires were collected. CBN led the discussions and ZV took notes. In addition to offering anonymity for survey responses and limited confidentiality for focus group discussions, we explained how we planned to report our results (without identifying information) and asked for permission to record discussions in digital audio. We explained all contact lists and recordings would be destroyed at the conclusion of the study. Sessions lasted approximately two hours.

2.4. Analysis

We analyzed questionnaire responses with PASW Statistics 18. Analysis of variance (ANOVA) with Tamhane T2 post hoc tested group differences on attitudes toward wolves. CBN and ZV created verbatim transcripts of the audio-recordings from each focus group. We used a long-table approach to analyze the transcripts – a process of identifying themes through cutting, sorting, comparing and contrasting quotes from transcripts (Krueger and Casey, 2000). Themes were defined in two ways: (1) according to initial research questions/concepts that were included in the discussion guide questions and (2) using the 'grounded' approach, in which themes and explanations are generated inductively (Dandy et al., 2012, p. 4). CBN and CT grouped comments by theme, taped them to a corresponding sheet of flipchart paper and then prepared a descriptive summary for each page, comparing and contrasting comments by stakeholder group and region.

3. Results and discussion

The nine Time 1 focus group discussions involved 66 participants (26 farmers, 21 deer hunters, and 19 bear hunters). Shortly after the wolf harvest commenced (Fig. 1), we convened the Time 2 focus groups with 53 participants (18 farmers, 18 deer hunters, and 17 bear hunters).

3.1. Behavioral inclinations: anonymous questionnaire

Most Time 1 survey respondents ($n = 45$, 71%) indicated that they would try to kill a wolf in certain situations even though it is illegal. A larger percentage of farmers (87%) expressed an inclination to kill a wolf illegally than bear hunters (74%) or deer hunters (52%). The most frequently chosen situation in which respondents would try to kill a wolf was when a wolf approached pets or farm animals (Table 1). About half of those who indicated they would try to kill a wolf indicated they would if it "came too close to my home" and "did not run away from me when I was on foot" (Table 1). Some respondents wrote additional reasons for killing wolves illegally. For example, one bear hunter stated, "I would kill a wolf because I heard them killing my dogs. It was the worst feeling I ever felt. It's payback time!" Explanations provided by respondents who would not kill a wolf illegally included "It's against the law" and "Don't want to be fined."

Inclinations of Time 2 participants were consistent with those indicated on the first survey. A majority of Time 2 survey respondents ($n = 38$, 73%) indicated an inclination to kill a wolf illegally (i.e. without a landowner permit or hunting license). Similar to the Time 1 group, a larger percentage of farmers (94%) indicated they would kill a wolf than bear hunters (81%) or deer hunters (44%). Again the most frequently chosen situation in which respondents would try to kill a wolf was when a "wolf approaches my pets or farm animals". Consistent with the Time 1 survey, other frequently selected situations were when a wolf "came too close to my home" and "did not run away from me when I was on foot" (Table 1).

In sum, behavioral inclinations to kill wolves illegally did not change after the policy interventions.

3.2. Attitudes: questionnaire

Most Time 1 pre-intervention survey respondents (76%) reported a slight to strong negative attitude toward wolves, whereas a minority (16%) expressed slightly to strongly positive attitudes, and the remainder were neutral (8%). A one-way ANOVA showed there was at least one significant difference between groups (Table 2). The Tamhane T2 statistic for post hoc comparisons of means assuming unequal variances (the Levene test showed unequal variance ($F = 6.30$, $p = 0.003$)) indicated that farmers and bear hunters did not differ significantly. However, deer hunters were significantly more positive toward wolves than farmers or bear hunters. This is an important distinction, as identification with a stakeholder group can influence attitudes and beliefs regarding species and their impacts, and these, in turn, can affect the acceptability of management actions (Bruskotter et al., 2009). Previous research on hunter attitudes toward wolves (e.g., Ericsson and Heberlein, 2003; Tucker and Pletscher, 1989) has typically not distinguished hunters by hunting method or game species, but rather treated hunters as a homogeneous group (see Kellert (1996) for discussion of differences in hunter types).

Time 2 respondents indicated a similar pattern in attitudes toward wolves, with a majority (67%) expressing a strongly to slightly negative attitude and minorities indicating they strongly to slightly like (23%) or are neutral toward (10%) wolves. The mean attitude of deer hunters was significantly more positive than the attitudes of farmers and bear hunters ($F = 19.91$, $p = 0.001$) (Table 2). At both points in time, deer hunter responses to the attitude measure were distributed across response choices, whereas all bear hunter and almost all farmer responses were negative (Table 3). In sum, attitudes to wolves did not change after the policy interventions.

While this general pattern was also revealed during the focus groups discussions, a more diverse and complex picture emerged.

3.3. Attitudes toward wolves: group discussions

3.3.1. Bear hunters

Bear hunters were often more emotional than participants in other groups, with some raising their voices or slamming the table with a hand in anger and others becoming tearful when recounting the occasions they lost hunting dogs to wolves. During focus group

Table 1
Situations in which respondents would kill a wolf illegally.

	Time 1						Time 2					
	Farmer		Deer Hunter		Bear Hunter		Farmer		Deer Hunter		Bear Hunter	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Situation												
Any wolf I encounter on my own	05	22	0		06	33	02	11	0		05	31
The wolf did not run away from me when I was on foot	12	52	3	14	09	50	10	56	5	28	07	44
The wolf did not run away from my vehicle	04	17	1	05	05	28	01	06	0		04	25
The wolf was on my property	05	22	1	05	07	39	02	11	2	11	06	38
The wolf came too close to my home	11	48	2	10	12	67	09	50	2	11	08	50
The wolf approached my pets or farm animals	16	70	9	43	13	72	15	83	7	39	12	75
The wolf was in my deer management unit	03	13	0		05	28	01	06	0		02	13

Table 2
Average attitude by stakeholder group.

	Farmers	Deer hunters	Bear hunters	*F*	*p*-value
Attitude[1,2]					
Time 1	2.08[a]	4.14[b]	1.56[a]	21.34	0.001
Time 2	2.24[a]	4.83[b]	1.94[a]	19.91	0.001

[1] Means with different superscripts are significant at $p < 0.001$.
[2] Attitude is based on a single-item indicator measured on a seven-point scale (strongly dislike [1] to strongly like [7]).

Table 3
Time 1 and Time 2 attitudes toward wolves by stakeholder group.

	Farmers		Deer hunters		Bear hunters	
	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)
Attitude[1]						
Don't like	92	88	38	22	100	100
Neutral	04	06	19	22		
Like	04	06	43	56		

[1] The 7-point attitude scale ranging from strongly dislike [1] to strongly like [7] was collapsed for this analysis.

discussions, bear hunters used words like "hate" or "strongly oppose" to describe their attitudes. However, a number of individuals revealed that their problem was not with the wolf per se, but rather with the way the animal was managed, the wolf population size, the limitations wolves place on their activities (e.g., where they hunt), or the socio-political environment that surrounds the wolf.

> *I'm not mad at the wolf. I'm mad at the people that brought the wolf here unnecessarily and are lying. I don't mind seeing a wolf. I don't want the wolf to interfere with the privileges that I had years back of being able to hunt and stuff. I don't like to see them kill my dog, but I can accept the fact they killed my dog. I know how to kill that female [wolf] in a second, you know, that killed my dog. . .I let her go because it's not her fault. It's just that I don't believe they belong here. I'm a law-abiding citizen. I'd like to believe that you like to do things according to law, but the law's crazy.*

None of the bear hunters expressed positive attitudes toward wolves during discussions, but a few did express more neutral positions than revealed on the questionnaire. Some indicated that they have not always been negative towards wolves, and perhaps they were even positive at one time. One bear hunter from the Central Forest group stated that, years before, he "was kind of an advocate for the wolves" because he thought it would be "pretty cool" to hear them in the wild, but his current attitude was extremely negative. For those who self-reported a shift in attitudes, it seems that as the level of experience increased and the novelty decreased, positivity declined.

In Time 1 and Time 2 discussions, the most frequently discussed concern was the perception that the wolf population was too large and "out of control" (rather than the animals themselves). "It went from being a treasure to see or hear [a wolf] to being so overpopulated you're disgusted," explained one Northeast bear hunter.

3.3.2. Farmers

Similar to the bear hunters, most farmers in the focus groups indicated they did not like wolves on the questionnaires. However, some farmers expressed neutrality and even some positivity during discussions. For these individuals, it seems the discussion format allowed them to explain their attitudes rather than being limited to a single-phrase questionnaire response. In the Central Forest group, discussion revealed attitudes were not as straightforward as the questionnaire results might suggest. One farmer stated, "I'm not as negative about wolves as I am against the management of them." Another recalled, as a kid, hearing a wolf howl on a camping trip in Canada. He thought it was "one of the coolest" experiences, but stressed that this occurred in the wilderness, not farm country. Another recalled the first time he saw a wolf on his property during deer season, stating "it was one of the most beautiful things I'd ever seen in the creek bottoms – just awesome, but then that was opening morning and there was not a deer." All of the positive comments were qualified by statements regarding some of the perceived problems with wolves in Wisconsin, including the following from a farmer who described the wolf as "majestic" and "beautiful."

> *I personally think they're awesome. They are an amazing animal. It's just there's too many and they're not controlled. That's really all that's wrong with having wolves.*

Negative attitudes were primarily explained by participants as concerns for livestock and human safety, particularly the safety of children. Farmers across groups raised a number of issues related to management, including population size, the legal status of wolves (i.e., inability to protect property), and the WDNR lying about wolf depredations. Farmers frequently expressed concern regarding economic costs to the state's deer hunting industry. Some farmers felt they could accept a wolf population in the state if it were restricted to forest land or if farmers were allowed to control problem wolves. Participants who expressed more neutral positions also had concerns with the management of wolves.

> *I'm neutral. I think there's a reason for them to be here, but when they get to be too many, like the deer were a few years ago, it's time to change your approach. Far as I'm concerned, I think they're gonna be there, and I think I'm okay with that, but when they're causing harm to my livelihood or my family, then I'm ready to cause harm to their family.*

[I am] mostly neutral. I don't like them, but what really bothers me is that our hands are tied behind our back. . .protecting ourselves and our herd.

3.3.3. Deer hunters

Similar to the questionnaire results, deer hunters' attitudes expressed during discussions tended to span the range of attitudes and included more positive attitudes toward wolves than those in the other stakeholder groups. Of course, members of this group had less experience with wolves than the farmers and bear hunters invited to our focus groups.

I'd say I like [wolves], but you know, I haven't had a lot of interaction with the wolf either, so I could change my mind in a hurry, I guess.

Deer hunters who were positive toward wolves made comments such as wolves are "beautiful," it is "neat" to hear them howl, and they "are supposed to be here," although some qualified their views with concerns for personal safety and a belief that there needs to be a reduction in the population size.

I'm happy there's wolves around. I'd like to see them keep their respect of me also. I don't want to become wolf food.

[– Northeast deer hunter]

Those who were more neutral made statements such as "I just respect them" and "I can live with them", but these statements were followed by the stipulation "they need to be managed." No matter the attitude, concern for human safety came up in all three deer hunter groups, as reflected in the following comment from a neutral Northeast deer hunter:

I've armed myself since some close encounters, but I don't ever intend to have to use it and I haven't had to use it, but I respect their size and what they do and they're perfectly capable of taking a human if they wanted a human...I don't think they like the way we taste, but I just like to feel safe when I'm out there.

The Northeast deer hunter group was particularly positive compared to other groups, with one individual noting, "There's an attitude of some deer hunters that doesn't seem to be in this room." However, two of the nine individuals in this group indicated they disliked wolves on the questionnaire, one "strongly disliked" and the other "slightly disliked" wolves, but these feelings were not shared during the discussion of attitudes. As with all groups, this group had concerns for human safety and favored "managing" the population.

3.4. Normative beliefs

During group discussions, we asked each group about their normative beliefs, or how they believed other members of their stakeholder group (e.g., other bear hunters) felt about the illegal killing of wolves. There was a belief among farmers in all groups that most livestock producers approved, or were at least tolerant, of illegally killing wolves. Some stated that farmers would be tolerant of others doing it (e.g., hunters on their land); whereas others indicated farmers themselves would do it, especially those who had previously experienced wolf damage.

There's not a cattleman that wouldn't thank you for shooting a wolf if you were hunting on his property or his neighbors' or wherever. If you let them come onto your land and hunt deer or whatever, you more or less know if you see a wolf, you shoot it.

[– Northeast farmer]

Reasons farmers gave for not supporting illegal killing of wolves included the risk of losing hunting privileges; they were against killing wolves in general; or they did not want to jeopardize chances for compensation.

Members of the deer hunter groups were clear in expressing their opposition of illegally killing wolves. Deer hunters adamantly defended deer hunters, in general, as law abiding citizens. One hunter stated that deer hunters would not kill a wolf on moral grounds. However, some participants stated that there are in fact deer hunters who endorse or participate in killing wolves illegally.

Most bear hunters believed that bear hunters, in general, sanction the illegal killing of wolves, although one individual stated that some bear hunters would not actually do it for fear that they would "get in trouble." Another stated "the average bear hunter would not shoot a wolf" unless they were angry about a past experience, but even then, they may not. Bear hunter comments on the topic were more brazen than those of the other groups.

I go out of my way. I spend a lot of time in the wintertime just looking to kill the wolves.

[– Northwest bear hunter]

A bear hunter's philosophy is if you shoot a wolf, don't even tell yourself.

[– Central Forest bear hunter]

3.5. Themes

Several interrelated themes emerged from the pre-post focus group discussions that may influence attitudes and behavioral inclinations toward wolves. A few of these themes, including those regarding experience with wolves and beliefs about the deer population, were drawn out by our questions. However, most are grounded in the data rather than being imposed by us.

3.5.1. Experience with wolves

This theme may seem rather obvious given that farmers and bear hunters were selected from a pool of wolf damage complainants, while deer hunters were randomly selected. That said, we found that all but one participant, a deer hunter, had some type of experience (positive or negative) with wolves (Table 4). Most survey respondents (84%) reported seeing wolves in the wild

Table 4
Experience with wolves at Time 1.

Type of experience	Total		Farmers		Deer hunters		Bear hunters	
	n	%	*n*	%	*n*	%	*n*	%
No experience	1	2	0		1	5	0	
Seen/heard wolf in wild	54	84	21	88	16	76	17	90
Seen/heard wolf on/near land	54	84	24	100	16	76	14	74
Heard someone in my county lost pet/domestic animal	42	66	16	67	12	57	14	74
Heard neighbor lost pet/domestic animal	25	39	10	42	4	19	11	58
Had livestock killed/injured by wolf	25	39	23	96	0		2	11
Had pet killed/injured by wolf	16	25	3	13	1	5	12	63
Had hunting dog killed/injured by wolf	19	30	0		0		19	100
Other	12	19	2	8	7	33	3	16

and/or on their land – the most frequently reported experience for deer hunters. On the Time 1 questionnaire, nearly 20% of respondents selected the "other" experience option. Bear hunters who selected this option described experiences such as being treed and being surrounded by wolves. One farmer reported being chased by a wolf. Most of the "other" experiences reported by deer hunters were benign, such as capturing wolves on trail cameras, or positive, with one deer hunter writing, "[I] have been literally face-to-face with wolves [on] 3 occasions – a nerve tingling sensation seldom seen or felt. Wonderful!"

During group discussions, we explicitly asked if participants had any positive experiences with wolves. Some made comments such as, "Yeah, when they said they were all killed" or "I seen one get hit by a truck one time," but some participants recounted interactions that were positive and had usually occurred before they had experienced wolf damage.

They're a beautiful animal. There's no doubt about it. They're pretty to hear. I listened in our pasture one night and heard them howling and I told my uncle, I said, "They're pretty to hear, but not here." I mean there's a lot of other areas where they could be.

[– Northwest farmer]

Honestly, I remember years back, I had a brother, and we hunted together quite a bit. And we seen what we felt was a wolf. It was kind of exciting.

[– Northeast bear hunters]

Experience, direct and indirect, can influence attitude strength and, in turn, attitude-behavior correlations (Fazio and Zanna, 1978). It is therefore an important consideration for wildlife professionals concerned with the effects of human action on wildlife populations. Research in social psychology suggests that individuals who have had direct experience with an attitude object are more likely to have stable, difficult-to-change attitudes (Doll and Ajzen, 1992). Conversely, individuals who have no or only indirect experience might be more likely to change their attitudes upon directly experiencing an attitude object (Ajzen and Fishbein, 1980). While direct experiences with wolves were associated with more negative attitudes among residents of wolf range (Ericsson and Heberlein, 2003; Williams et al., 2002), it has been suggested that indirect experience is more important and may explain why those living in wolf territories tend to have more negative attitudes (Karlsson and Sjöström, 2007). Research has demonstrated that information garnered through friends, other important referents, and the media can lead to negative attitudes toward wolves (Hook and Robinson, 1982). Indirect experience may then provide an avenue for wildlife professionals to reverse the negative effects of proximity (e.g., through reports of positive or neutral interactions with wolves). Wildlife managers involved in wolf management and other controversial issues have the challenge and opportunity to monitor and address information (indirect experience) in the media and among stakeholders. In Wisconsin, interventions using communication and outreach can address many of the stakeholder concerns and misperceptions identified in our study (see below).

3.5.2. Wolf population size

Issues related to the size of Wisconsin's wolf population were brought up by participants in each group. These included the state management goal, the population size, and the acceptable number of wolves. First, there was a significant amount of confusion about the state management goal. Some participants believed it was intended as a population cap rather than a goal. Knowledge of the state management goal of 350 animals was limited, with participants offering numbers ranging from 100 to 400. The belief that the wolf population had far exceeded the management goal was prevalent across groups.

The WDNR's minimum wolf count conducted in the winter of 2010–2011 estimated the population at 782–824 (Wydeven et al., 2011). However, there was a common lack of confidence in the WDNR's ability to count wolves accurately. Time 1 focus group participants provided population estimates ranging from 400 to thousands. The belief that there are too many wolves in the state was expressed in all groups as was the belief that the wolf population needed to be reduced to a lower level. Stated preferences for a maximum population level (often referred to as wildlife acceptance capacity – see Carpenter et al., 2000) varied. Whereas a few participants indicated they wanted wolves eliminated altogether, more individuals expressed the view that a certain number of wolves could be tolerated and offered a range of population caps up to 500.

I would like to get to a point where there is presence, but not a damaging presence.

[– Central Forest farmer]

There's a number between zero and where we're at now where we can all live together.

[– Central Forest bear hunter]

3.5.3. Reintroduction vs. recolonization

The origin of Wisconsin's wolf population – reintroduction versus natural recolonization – came up in several group discussions and was a source of confusion and debate. Wolves were considered extirpated from Wisconsin by 1960 (Thiel, 1993). Although a small number of wolves may have persisted, recolonization of the state began in the mid 1970s, with the Minnesota wolf population most likely serving as the source (Wydeven et al., 2009). However, our participants held mixed beliefs on this topic. Some believed wolves "have always been here"; some thought they were reintroduced by the WDNR; some believed they came from Minnesota; or some thought the current population was a result of a combination of these modes.

The belief that Wisconsin's wolves were reintroduced by the government was prevalent in our focus groups. Some who believed there had been a reintroduction program accused the WDNR of a cover-up. Perceptions of governmental domineering may translate to negative attitudes toward wolves. This is supported by research on the reintroduction of wolves to Yellowstone National Park that found some local residents viewed the reintroduction of the wolf as a control tactic of the federal government (Scarce, 1998).

3.5.4. Fear of wolves

Fear of wolves was prevalent among all stakeholder groups. There were many comments, such as "you always feel like you're being watched" or "it makes the hair on the back of your neck stand up." Several participants cited stories of wolves killing people in Alaska and Canada and feared it was "only a matter of time until there'll be an attack on a human in Wisconsin." The most commonly voiced concern was for children playing outside, with several participants across groups stating that they do not allow their children or grandchildren to play outside unless accompanied by an adult.

Fear-related concerns of each stakeholder group often varied by context. Farmers expressed fear of being out in the fields without a gun. Some indicated they started carrying guns in fear for their safety. Farmers discussed concern for children more than any other group, perhaps because their interactions with wolves had occurred on the family farm, whereas most hunters experienced interactions while hunting away from home. According to many farmers, fear of wolves had affected their daily lives by limiting

their activities, not only how they managed their stock but also their movements on the farm.

My biggest fear is my children and trying to protect them and even just living in that fear of "I guess I really can't go outside, can't let the kids go outside because a wolf is gonna get close to my house." I had them walk through my yard. So, it's definitely a scary and real thing.

[– Northwest farmer]

Deer hunters talked about being afraid while out in the woods. They also expressed fear for the safety of children in the woods. Some recounted incidents where they or someone they knew were unable to leave a deer stand because wolves were below them. Even in the Northeast group, where attitudes toward wolves seemed more positive, deer hunters were fearful of wolves.

I think there's more fear with a wolf than anything else. I mean, bears, if they're going to attack you, you're probably going to go after it before it attacks you. It's going to run away.

[– Central Forest deer hunter]

Bear hunters were also concerned about personal safety when out hunting. Members of the Central Forest group discussed their fears at length. Some reported that they no longer took their children hunting because of wolves. They had concerns about camping or fishing unarmed. Some reported being surrounded by wolves when out with their dogs. They distinguished between their feelings about wolves and other predators and, similar to other groups, bear hunters were more fearful of wolves than bears and other wildlife.

I'm starting to carry a gun when I go snow-shoeing with my two sons and we'll have a bird dog running around. I don't want that bird dog to get in with a wolf and bring it back to us. I'm telling you, for me to carry a gun because I think that I need it is a pretty sad day in Wisconsin because I've been within three feet of a lot of bears without a gun and I'm not even worried about it. I'm not even nervous about it. But for someone like me to carry a gun for protection says that there's something to be alarmed about.

[– Northeast bear hunter]

Worldwide, particularly in North America, the risk of wolf attacks on humans is very low (Linnell et al., 2002), especially in comparison to other large carnivores. However, fear of wolves persists around the world (Linnell et al., 2002). Though fear of wildlife in modern settings may at times "appear to be irrational and unrealistic" (Røskaft et al., 2003), it is real to those who feel it. Fear is a dimension of affective risk perception (Sjöberg, 1998). Risk perceptions are important to understand, as they can influence attitudes and behaviors toward wildlife and receptivity to educational communications (Gore et al., 2009; Riley and Decker, 2000). In addition to fear, risk perceptions are based on the presence of certain factors including perceived control over the risk and trust in the individual or group charged with managing the risk – additional themes that emerged from our discussions (see below).

3.5.5. Bold wolves

Related to fear of wolves is a perceived lack of fear of humans among bold or habituated wolves. Most Time 1 (73%) and Time 2 (65%) survey respondents agreed that wolves have lost their fear of people, although there was variation between groups. For instance, in the Time 1 survey, majorities of bear hunters (95%) and farmers (87%) agreed that wolves have lost their fear of humans, whereas only a minority of deer hunters (38%) held this belief. Deer hunters ($M = 3.17$) were significantly less likely to believe wolves have lost their fear of humans than farmers ($M = 4.24$) and bear hunters ($M = 4.42$, $F = 12.00$, $p < 0.001$).

During discussions, several participants recounted stories of bold wolves standing their ground rather than running away at the sight of a human. Farmers talked about wolves coming near their tractors or not running off when they were spot-lighting from a short distance. Bear hunters agreed that wolves have lost their fear of humans. Farmer and bear hunters repeatedly expressed the need to restore the fear of people back in wolves by shooting them or shooting at them.

They're not afraid anymore. We can't touch them and they know that. They've lost their fear of humans and that's the most dangerous thing of all.

[– Central Forest farmer]

Deer hunters in the Central Forest and Northeast groups described a lack of fear among wolves, albeit to a lesser extent than farmers and bear hunters, with deer hunters spending less time discussing this topic and being less emphatic than the other groups. Deer hunters in the Northwest group did not feel that wolves have completely lost their fear of people.

Research has documented increasing tolerance of humans or habituation among some wolves in Wisconsin (Heilhecker et al., 2007). Linnell et al. (2002) identified habituation as one of four factors associated with wolf attacks on humans around the globe and recommend the development of management protocols for dealing with habituated wolves that include parameters for normal wolf behavior. Although rare, there have been non-fatal wolf attacks on humans in the 20th century (Linnell et al., 2002). Where wolves are in fact becoming more tolerant of human activities, the people living, working, and recreating in these areas need to understand how human activities affect wolf behavior, and managers need response plans to deal with bold and threatening wolves (Heilhecker et al., 2007). In Wisconsin, long-term monitoring of the influence of lethal control and wolf harvests on wolf behavior should inform effective management of this issue.

3.5.6. Wolves and deer

Questionnaire responses indicated that majorities of Time 1 (75%, 82%) and Time 2 (71%, 75%) respondents believe "Wisconsin's wolf population has significantly reduced the deer population" and "threatens deer-hunting opportunities" respectively. In both data collection periods, around half of the deer hunter participants disagreed with or were neutral on these beliefs (see Table 5 for a

Table 5
Beliefs about wolf effects on deer at Time 1.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Don't know
Wolf population has significantly reduced deer population						
Farmers			4%	39%	52%	4%
Deer hunters	10%	14%	33%	14%	24%	5%
Bear hunters			5%	26%	68%	
Growing wolf population threatens deer hunting opportunities						
Farmers			9%	48%	44%	
Deer hunters	10%	5%	30%	35%	20%	
Bear hunters				26%	74%	

comparison of Time 1 groups), whereas most farmers and bear hunters agreed.

Similar to questionnaire results, a majority of focus-group participants expressed the belief that the deer population is down, but discussions revealed that explanations for the perceived decline were varied. Farmers across regional groups indicated they believed the deer population had declined significantly with statements such as, "We used to see fifty, seventy-five, one hundred on our fields in the evenings. Now, you might see two." Some farmers felt that the reason wolves were drawn to their farms was because farmers had been stewards of the local deer herds, especially the does, whereas they were over-harvested in other areas, but felt the wolves had since "finished off what we had." In addition to the influence of wolves, farmers felt a decline was brought about by the WDNR issuing too many hunting permits. Some farmers mentioned the influence of insurance companies lobbying to reduce road collisions involving deer. This "unanticipated issue" was also raised in focus groups with deer hunters in Kentucky who believed the auto insurance lobby influenced the number of deer permits at times when deer-vehicle collisions were on the rise (Mangun et al., 2007, p. 162).

Deer hunters who believed there were fewer deer also offered a number of explanations, including the availability and use of too many doe tags, coyotes and bears preying on fawns, land-management practices (e.g., types of crops planted and cutting down trees), and road collisions. Members of the Northeast group also mentioned the influence of the insurance lobby on the WDNR. However, not all deer hunters believed the deer population was low or declining and suggested that deer behavior has changed – that they have become more nocturnal. One hunter offered as evidence the large number of bucks he captures on his trail camera at night when none are seen during the day. This is supported by research demonstrating increased vigilance of deer to avoid wolves (Nelson and Mech, 2006; Proffitt et al., 2009; Ripple and Beschta, 2004). Explanations offered for decreasing hunter success included changes in hunting methods (e.g. baiting) and increasingly limited hunter access to private property. As one hunter stated, "The herd size may not be reduced, but the actual 'huntable' herd has." Although it seems that most of the deer hunters in our focus groups did not feel wolves were the primary or sole reason for the perceived decline in deer, they acknowledged that there are deer hunters who do hold this belief. They described the increasing frustration among hunters unable to bag, or even sight, deer and indicated that some deer hunters may shoot wolves illegally as a result.

Bear hunters did not discuss deer as often or at the same length as farmers and deer hunters, but they raised similar issues. However, some bear hunters felt that the problem with deer was limited to the northern part of the state or just to areas that are occupied by wolves.

> *The deer are pretty scarce now. I'm sure there's too many doe permits, but the wolves gotta have something to do with it because they're not killing the deer off where there aren't wolves. In farm country there, there's plenty of deer yet.*
>
> [– Central Forest bear hunter]

The 2001–2009 Wisconsin panel study found the strongest correlation with increased inclination to kill wolves illegally was perceived competition for deer (Treves et al., 2013). Our focus group findings add another dimension by suggesting that it may not be deer hunters in general with this inclination, but rather those who also farm, bear hunt, or perhaps have other issues with wolves. While it is difficult to measure the effects of predation of wolves, and other predators, on deer (Jacques and Van Deelen, 2010), researchers have concluded that there is a "thriving deer population" in the areas of Minnesota, Wisconsin, and Michigan currently occupied by wolves "in spite of predation by wolves" (DelGiudice et al., 2009, p. 168). However, perception is important and our participants largely believed there was a decline in the deer population, regardless of the reason. Given that the link between this perception of wolf predation and poaching is unknown, the influence of communicating these findings is also uncertain. Continued monitoring of this human dimension of wolf management, including experiments with communication and outreach, is needed in Wisconsin's wolf range, as well as in other areas occupied by wolves. Managers, therefore, have the challenging task of balancing the social and biological data in developing policy and communicating decisions with the public.

3.5.7. Powerlessness

In all farmer and bear hunter groups, participants expressed feelings of powerlessness in dealing with wolves. The lack of power was felt at the individual level as evidenced in statements such as, "What really bothers me is that our hands are tied behind our back...in protecting our herd" and at the state level as illustrated by the comment, "Wisconsin should be able to take care of Wisconsin." Participants felt frustrated and angry that individuals and groups from outside of Wisconsin's wolf range had influence on the management of the state's wolf population, whereas the people living with wolves had none. Participants had different views on which "outsider" group was influencing wolf management. Some felt there was a problem within the state between residents of the north and residents of the south (i.e., the cities).

> *They talk wolf policy and deer policy and everything and managing our predators up north here and they have all these meetings down in Madison where you have all these anti-hunters that don't know jack about what's going on up here, and they're controlling what happens up here because they have the population and the votes. We know what's going on because we live here, and yet they're telling us down there what we have to do up here. That has to be changed.*
>
> [– Northeast bear hunter]

Some participants were incensed by the perceived involvement of special interest groups, particularly animal rights groups, but also the putative role of auto insurance industry. One farmer and one bear hunter mentioned attending meetings on wolves, only to find the meetings were dominated by well-prepared representatives of animal rights groups such as People for the Ethical Treatment of Animals and the Humane Society of the U.S. However, the "group" that seemed to cause the most frustration was the federal government. Related was the frustration with the oscillating legal status, and resulting management policy, of Wisconsin's wolves. Group members neither understood nor agreed with federal control of what they viewed as a state issue and expressed a strong desire for state control of wolf management. There was a belief that the WDNR's "hands are tied" and that state management would lead to more controls on the wolf population (i.e., depredation management, population control). This was particularly evident in the farmer focus groups.

Empowerment can be defined and measured in a variety of ways. In the realm of environmental conflicts, fundamental components may include respect, participation, and access to and control over resources (Zimmerman, 2000). In wolf recovery, empowerment can be associated with the symbolism of wolves. That is, wolves may represent urban society or governmental dominance (Ericsson et al., 2008; Nie, 2002; Williams et al., 2002). For example, shortly after the reintroduction of wolves to Yellowstone National Park, many local residents viewed wolves as "governmental surrogates, powerful agents of control bent on ruining their lives

and destroying their cherished frontier freedoms" (Scarce, 1998, 42). This sentiment was frequently expressed in our focus groups and underscores the limited potential for compensation and lethal depredation control (by authorities) to increase tolerance of wolves. Instead, approaches are needed that help key wolf-management stakeholders feel empowered or to have a sense of control. Though the WDNR has a history of providing opportunities for public input and participation in research, it is evident from our findings that previous approaches were not perceived as being adequate by individuals involved in conflicts and other stakeholder groups. Continued monitoring of perceived empowerment in this dynamic management environment is necessary to identify public preferences for participation. Future research should examine the long-term effects of recent changes such as state vs. federal management authority and the use of lethal management.

3.5.8. Agency trust

Despite support for state authority for wolf management, focus group participants complained at length about the WDNR, especially when discussions turned to the wolf population count and deer management. Focus group participants commonly believed the state's count was off by hundreds if not thousands of animals. Miscounts were usually attributed to incompetence or dishonesty. Trust is related to other constructs such as risk perception and knowledge (Siegrist et al., 2005). Without trust, the public is less likely to support management actions for addressing risk (Winter et al., 1999). Agency trust is conceivably at the core of most of the other themes identified in our focus groups. Those who believe wolves were secretly reintroduced, doubt population estimates, believe wolves are being mismanaged leading to a decline in the deer population, and who fear an "out-of-control" wolf population, have diminished agency trust.

Whereas deer hunters largely blamed the WDNR for the perceived decline in deer, once again, bear hunters were the most emotional and hostile in their comments regarding the WDNR and the state's wolf biologist. They expressed beliefs that the WDNR: (1) is involved in cover-ups on the wolf issue, (2) is unable to count wolves, and (3) has a biased wolf biologist. Some bear hunters complained about the way the WDNR handled their claims for dog injuries/deaths. Complaints ranged from being reimbursed an insufficient amount to perceived insensitivity in communications with the WDNR (e.g., phone calls and letters that accompanied payments). Some became extremely angry when talking about their interactions with the WDNR, with one individual even suggesting that hunters would rather shoot the state's wolf biologist than a wolf.

Issues of trust continued to be a central issue in Time 2 discussions. "I'm going to tell you straight out, plain and simple, the DNR is not honest in what they say. They lie, they lie, they lie" said a Northeast hunter. Trust is a critical dimension of an agency's credibility and ability to be effective (Vaske et al., 2004) and points to the need for agencies to be proactive in building and maintaining public trust through increased public involvement of stakeholders (Stout et al., 1992), improved communication, and transparency (Winter et al., 1999).

3.6. Participant evaluations of management changes

3.6.1. Lethal depredation control

A plurality of Time 2 survey respondents disagreed that their "tolerance of wolves has increased since the start of official (legal) lethal control of wolves that kill livestock," with a nearly identical minority (38%) in agreement that their tolerance had increased. The remaining respondents were neutral (19%), or not sure (4%). Discussions revealed that, although attitudes and tolerance were not drastically affected by lethal control, all the groups were fairly supportive of it, saying they appreciated the opportunity for landowners to take the matter of problem wolves into their own hands (i.e. empowerment). However, a number of farmers claimed that they were not notified of being eligible for lethal control permits. They also pointed out that even if permission were granted, they were often too busy to wait for and shoot problem wolves. Few farmers were aware that it was permissible to allow others to shoot wolves on their land if they were unwilling/unable to fill the permit themselves. Some farmers expressed wishes to obtain permits before a depredation occurs—"I honestly believe if there's known wolves in your area, you have livestock or whatever, it shouldn't be a question" said a Northeast farmer. Although farmers described lethal control as a step in the right direction, overall they felt they had little change in attitude or tolerance.

Deer hunters identified benefits of lethal control, including the potential to increase fear of humans among wolves and more control for livestock owners. Some deer hunters raised concerns about indiscriminate killing of wolves: "If you've got livestock and you're having a problem with *a* wolf, shoot *that* wolf." They also found the number of wolves killed via lethal control (at that time, 17 were shot on landowner permits and 50 euthanized) to be quite high.

Overall, bear hunters were generally supportive of lethal control, but did not feel it affected their attitudes or tolerance because it would not reduce the wolf population and it had little direct benefit to bear hunters. "It's good that they're helping the ranchers, the livestock owner. . .But for me looking out for me, it's not helping." While they agreed it could take care of some problem wolves, their biggest concern was the high population, which would be mostly unaffected by lethal control.

3.6.2. Wolf harvest

Similar to lethal control, a plurality (40%) of survey respondents agreed that their "tolerance of wolves has increased since WI Act 169 provided public hunting of wolves," with other respondents in disagreement (35%), neutral (15%), or not sure (10%). Participants in pre- and Time 2 group discussions expressed strong support for a wolf harvest season, often favoring it over lethal depredation control, as they believed hunting and trapping to be the best methods for reducing the wolf population – what they perceived as the central issue in Wisconsin's wolf management.

Though support for harvesting wolves remained strong, Time 2 discussion participants believed there were significant flaws in the design of the harvest season. The primary complaint across stakeholder groups was the harvest quota. The WDNR set the quota at 201 animals (based on the most recent minimum count of 850) with the objective to "begin to reduce the wolf population (WDNR, unpublished). However, 85 tags were allotted to the Ojibwe tribes in ceded territory, which they elected not to use, leaving 116 for licensed hunters and trappers. Participants were generally annoyed by this policy because it essentially lowered the quota. "It looks to me like the tribe is basically taking over running the DNR" stated one bear hunter. Another described the harvest an "insult" because it would have little effect on the wolf population. Another problem with the harvest season, according to bear hunters, was a temporary injunction on the use of hunting dogs. Bear hunters were incensed and reported applying for wolf tags but then withdrawing after discovering that they could not use their dogs. Many stated that their tolerance for wolves would increase only if they could use dogs while hunting them.

Harvesting wolves was not acceptable to all participants. Though most deer hunters expressed support for harvest, a few expressed opposition. There were concerns about the impact on wolf packs of killing alpha wolves. One deer hunter stated, "If I would have applied for a tag and got one, it would've been just to save a wolf" by taking the opportunity away from another hunter.

Hunters in the Northeast group said that the harvest would improve attitudes because it would keep the wolf population under control. They also said that it would cause wolves to fear humans more, which would decrease human safety concerns. Deer hunters across groups expressed the belief that the public harvest was a good start to controlling the wolf population. This belief was shared by members of all three stakeholder groups. Though many said it did not change their attitudes toward wolves, they felt a regular wolf harvest season could reduce the wolf population and, in turn, increase their tolerance of wolves.

4. Conclusions

Using a pre/post-design in a quasi-experimental setting (i.e., not randomized assignment and with no control over the timing or dissemination of the treatment), we used both a quantitative questionnaire and qualitative focus groups to examine attitudes toward wolves and inclinations to poach among three key stakeholder groups in Wisconsin's wolf range. We found limited support in the short-term for the notion that legalizing lethal control by a variety of mechanisms would raise tolerance for wolves. While approximately 40% of our study participants at Time 2 indicated their tolerance had increased following the implementation of lethal control measures (landowner permits, state-conducted lethal damage management, and the harvest season), negative attitudes toward wolves and inclination to kill wolves illegally remained consistent across Time 1 and Time 2. Though further research is needed to clarify this finding or produce results that are generalizable, this apparent inconsistency may be based on how participants define "tolerance." Whereas public tolerance of wildlife is a common topic of investigation in wildlife conservation, there is ongoing debate in how to conceptualize and operationalize this concept when conducting human dimensions research (see Treves and Bruskotter, 2014).

We demonstrated the potential for a mixed-methods approach to elucidate complex wildlife issues and sensitive topics such as illegal killing of wolves. Our focus groups revealed more nuanced attitudes toward wolves than previous surveys have identified. Whereas a majority of focus group participants maintained the negative attitudes expressed on the questionnaire during group discussions, some participants revealed a degree of neutrality, and still others expressed more positivity than one might expect after reviewing questionnaire responses. This variation might be explained by the effects of group interaction. Participants may have been reminded of things that were not salient at the time they completed the questionnaire or compelled to consider the viewpoints of other group members who were similar to themselves. Another explanation could lie in the methods themselves. Questionnaires limit response choices; therefore, respondents who have negative feelings associated with wolves rather than about wolves may communicate these associated feelings when asked specifically about wolves on a questionnaire. Focus groups, on the other hand, allow more flexibility in questioning and responding. The traces of positivity and neutrality toward wolves found here may serve as building blocks for building consensus on wolf policy.

Our findings support the use of a mixed-methods approach using focus groups and individual response techniques to explore sensitive topics. Whereas some focus groups may produce a synergism that allays social constraints on discussions of sensitive topics (Mariampolski, 1989), there have been mixed results (Helitzer-Allen et al., 1994; Kaplowitz, 2000; Wutich et al., 2010). Whereas there was more neutrality and positivity indicated in the focus groups versus the survey, this was potentially limited in some groups by group effects. For example, in the more emotionally-charged bear hunter groups, it is possible that individuals did not feel comfortable revealing positivity. The anonymity of the self-administered questionnaire allowed respondents to indicate their inclination to act illegally without threat of penalty. Anonymity has been shown to be "very powerful" in comparison to methods that simply offer confidentiality (Ong and Weiss, 2000). Focus group discussions, on the other hand, provided a good context for discussing social norms. Researchers claim that focus groups are "particularly advantageous" where group norms are counter-cultural (Bloor et al., 2001, p. 90). Our focus groups were comprised of individuals with shared attitudes, beliefs, and experiences regarding wolves. In many cases, participants volunteered their attitudes, beliefs, and even behavioral intentions that could be categorized as pro-poaching. Focus groups and individual response methods appraise different facets of cognition and, therefore, a mixed-methods approach "may be ideal for research on sensitive policy-related topics" (Wutich et al., 2010, p. 107).

The themes that emerged from our focus groups demonstrate the complexity of attitudes toward wolves and wolf management. Focus group discussions brought to the fore beliefs and concerns that may not have been detected by a mail-back questionnaire survey. These interrelated themes can provide avenues for managers and other stakeholders to address social tolerance of wolves in Wisconsin and suggest questions and approaches for research in other regions. Central to several of the themes we identified is agency trust, pointing to the need for agencies to give greater consideration to building and maintaining the public's trust through improved communication, transparency, and public involvement.

Empowerment was another key theme identified in our focus groups and in other regions occupied by wolves (Heberlein and Ericsson, 2008; Scarce, 1998). Feelings of powerlessness were in part the result of a perceived dominance of outside groups in affecting state/local policy and a perceived lack of opportunity for local input on wolf policy. It is suggested that participatory research methods such as focus groups can empower individuals and groups (Scott, 2011). While we cannot confirm that our participants left feeling more empowered, we can say the discussions seemed to have a cathartic effect. Participants expressed gratitude for the opportunity to provide their views and interest in continued participation in our research. Individual and community-level empowerment is increasingly acknowledged in environmental issues underscoring the need for including local people in entire processes – problem definition, data collection, decision-making, and implementation (Slocum and Thomas-Slayter, 1995). Focus groups and other participatory methods may offer managers the opportunity to not only increase perceived and actual stakeholder empowerment, but also increase trust by increasing avenues of communication between agencies and constituents.

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