Supporting Information

Matching respondents over time and assessing non-response bias. Respondents sometimes left age or sex blank (*n*=52 from 2001 or 2004 and *n*=39 from 2009). When age or sex was blank in two surveys but other identifying characteristics matched, we assumed they were the same person because the chance probability that any two respondents both withheld age or sex was 0.08%.

Beyond reminder postcards and mailing two waves of surveys, we did not pursue non-respondents directly, because assessing bias via telephone would have introduced additional variability rather than illuminating changes in attitudes. Instead, we examined an indirect measure of non-response bias. We analyzed whether the initial attitudes of respondents in 2009 differed from the initial attitudes of non-respondents in 2009 because initially all were respondents. High-exposure panelists who chose the lethal option in the livestock depredation scenario were more likely to respond in 2009 and low-exposure panelists who chose the lethal option in the pet scenario were less likely to respond in 2009 (Table S1).

Imputation: For the questions analyzed in this paper, we found 325 cases of item non-response out of 13,120 questionnaire items (2.5%). Following (Brick & Kalton 1996; Schafer & Graham 2002), we used deductive imputation or predictive mean imputation to reduce the loss of data. We could impute 121 of 333 (36%) non-response items. For 96 of the 121, we used deductive imputation (Schafer & Graham 2002) because redundancy in our questionnaire clarified non-responses (e.g., we asked about hunting in several questions so could discriminate hunters from non-hunters in 88 cases of item non-response). In 17 of the 121 imputations, a respondent filled in two

responses for the same item and left the following item blank, in which case we randomly selected one of the two responses to impute or deduced the intent from responses to other questions. In the remaining 8, we used predictive mean imputation (the strong correlation r_s=0.73 between responses to “year born” and “years lived in Wisconsin” allowed us to impute the latter).

Hunters: Definitions of hunter differ. Ours was broad because it included respondents who self-reported regularly hunting in the past or hunting in the last two years. This differs from an oft-cited nationwide telephone survey including 821 Wisconsin households that found ~14% had members who had participated in hunting in 2005, but the authors omitted the sampling frame and cautioned, “…[the result] does not tell us how many …hunters… there were because many do not participate every year” (p.2, USDOI & USDOC 2006).

We would have had fewer hunters if we allowed them to self-identify as such. For example, in our random sample of Northern Rocky Mountain (NRM) residents of wolf range from 2007 (Treves & Martin 2011), we found 67.4% hunters by the same definition used in this analysis. But in addition we asked those NRM respondents to self-identify as “a hunter” (48.2%), “not a hunter but not opposed to hunting” (47.5%), or “opposed to hunting” (4.3%). Thus we estimate self-identification might have decreased hunters in our Wisconsin panels by 20%.

Most hunters in our sample were recent (196 of 222 from the high-exposure panel and 227 of 313 from the low-exposure panel). An additional 26 and 86 panelists respectively were past hunters.

Wolf poaching. From 2001–2009, the U.S. Endangered Species Act prohibited private citizens from harming wolves except in defense of human life (USFWS 2003, 2009). This strict protection was widely publicized by the media and state directives, including focused instructions to hunters (WDNR 1999, 2007; Treves 2008). Although we used different wording in 2001, “If I were hunting deer and saw a wolf I might shoot it” – than in the 2004 and 2009 questionnaires that had identical wording (Table 1; attitudes were nearly identical in 2001 and 2004 (Treves & Martin 2011) and changes in attitudes were also; See Results). Therefore we ignored the wording difference.

Public wolf hunt: We had previously ruled out acquiescence bias or order effects in this question (Treves & Martin 2011). We could do so again by comparing responses to “No never” (5% and 8%, and 13% for the high-exposure panel and the low-exposure panel) to a separate statement presented for the first time in 2009, “I would oppose all hunting of wolves”. For the latter, 7% of each panel agreed. Thus we found no acquiescence bias or order effect in the public hunt question in 2009.

Table S1. Assessing non-response bias in two panels of respondents from Wisconsin between 2001 and 2009. Note residents living outside of wolf range are included in the non-respondents so this exaggerates the differences.

Table S1. The differences in responses between two classes of respondents from 2001 and 2004: those who did not respond in 2009 (*n*=269 and *n*=281 respectively) minus those who did respond in 2009 (*n*=252 and *n*=403 respectively). Complete text of each survey question can be found in the Methods and Table 1

	Response options				
Survey items	Immediate	Sustainable	Depredation	Never	Contingency test
(year) Public wolf-hunt	+9%	-2%	-2%	-5%	χ^2=6, p=0.12
(2001 & 2004) Public wolf-hunt	0%	-6%	0%	+6%	χ^2=8, p=0.06
(2004)	Monitor	Scare	Relocate	Kill	
Livestock	+2%	+11%	+5%	-18%	χ^2=17, p<0.01
scenario (2001) Livestock	-3%	+4%	+1%	-2%	χ^2=3, p=0.46
scenario (2004) Pet scenario	+2%	+8%	+1%	-11%	χ^2=7, p=0.07
(2001) Pet scenario	-7%	+6%	-2%	+3%	χ^2=11, p=0.01
(2004)	Agree [a]	Neutral	Disagree [a]		
Fear wolves	0%	-1%	0%		χ^2=0, p=0.98
(2001) Greatest	-7%	0%	+7%		χ^2=6, p=0.19
experience (2001)					

Threaten deer hunting (2001)	+11%	+1%	-11%	χ^2=9, p=0.05
Deer health (2001)	-11%	-3%	+14%	χ^2=11, p=0.026
Maintain balance (2001)	-13%	+4%	+10%	χ^2=10, p=0.04
Shoot wolf (2001)	+1%	+1%	-2%	χ^2=4, p=0.44
Shoot wolf (2004)	+4%	+3%	-8%	χ^2=5, p=0.26

[a] Agree and disagree include the extremes “strongly agree” and “strongly disagree” respectively.

Survey questionnaires are included as Supporting Information (Appendix S1, S2, and S3).

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