Methods and Results (unabridged) accompanying the following article:

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METHODS

Study site

Wisconsin extends over 138,644 km^2 with human population density of 41.1 km^{-2} and 18.7 housing units km^{-2} (http://quickfacts.census.gov/qfd/states/55000.html, accessed 31 January 2016). Many private lands and 75% of public lands were open to hunting for at least one season annually. These seasons included the autumn, white-tailed deer hunt involving approximately 500,000 hunters on public and private lands. Wolf range in Wisconsin contained no vast wilderness and few strictly protected areas (Mladenoff, Clayton, Pratt, Sickley, & Wydeven, 2009; Thiel, Hall, Heilhecker, & Wydeven, 2009; Treves, Martin, Wiedenhoeft, & Wydeven, 2009; Wydeven et al., 2009). Wolves used areas of the state with relatively less agriculture and human use than expected by chance (Mladenoff et al., 2009; Treves et al., 2009). Human residents were engaged predominantly in agriculture, timber, rural recreation, and other natural resource uses. In the summer of 2011, Wisconsin's gray wolves were federally protected as an endangered species. Wolves had never been a legal game species and bounties had been discontinued since 1957. The smaller canid, coyotes *Canis lupus*, could be shot on sight in much of the state most of the year.

Respondents

Complaints of property loss to wolves had to be verified by government agents inspecting the scenes of all encounters. Verifiers dismissed approximately 50% of such claims as non-wolf or unverifiable (Ruid et al., 2009; Treves et al., 2002). We drew our

respondent sample from the remainder deemed 'probable' or 'confirmed' wolf complaints only. We previously estimated the latter error rate in livestock incidents as <9% false positives (Treves, Martin, Wydeven, & Wiedenhoeft, 2011). We obtained telephone numbers of all complainants from 2007 to the spring of 2011 from the Wisconsin Department of Natural Resources. We conducted telephone interviews to record our respondents' memories of the circumstances surrounding their experiences with wolves and the respondents' self-reported appraisals of their capability to shoot the wolf or wolves. We replicated as closely as possible the methods used in Backeryd (2007). Typically, the more recent and salient an event is, the easier it is to recall (Pearson & Caroline, 1981). Although recall of events beyond even a few months may be limited, we believe the high degree of salience of events involving wild wolves would limit biases and error (Dex, 1995). We sent an advance-notice letter to the complainants so as to avoid surprise, improve the legitimacy of the survey (Salant & Dillman, 1994), and potentially increase the response rate.

Deer hunters were reached at random without advance warning by dialing telephone numbers in the same municipalities as the former complainant sample. We asked whichever adult answered the phone if they hunted deer but were not bear hunters or livestock producers, so as to differentiate the random sample from the complainant samples described above. We sought oral consent by script and used structured interview questionnaires (both available upon request) and guaranteed confidentiality orally. We did not record names of deer-hunters. We interviewed only

those respondents ≥18 years old. One recipient refused. The questionnaire items analyzed here are reproduced verbatim below.

Survey items

We did not ask telephone respondents if they were inclined to poach a wolf because we were concerned that the telephone interview would not be perceived as confidential enough to assure high rates of truthfulness. We were less interested in the respondent's intentions than in their perceived capability to act given the opportunity. After recording respondents' descriptions of the conditions during the encounter with wolves, we asked "Did you see the wolf/wolves immediately before, during, or immediately after the incident?" Of the subset with eye-witness encounters who answered 'yes' to the latter question, we then determined if they had been armed with a loaded weapon. Then we asked, "Playing the scene back in your memory, do you think you might have been able to shoot the wolf or wolves that you saw immediately before, during, or immediately after this incident?" We assumed our respondents were the best situated to estimate their own capability to kill the wolf they encountered, taking into account their recollections of their internal condition at the time and external conditions (light, visual obstructions, distance, etc.) at the time of the encounter. Although people over-estimate or under-estimate their capability, no one else could make a better judgment. Our alternative would be to use the conditions at the scene (light, visibility, readiness, etc.) but that would substitute our judgment for theirs, which we could not justify.

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Inclination to poach

We used the results of three prior mail-back questionnaire surveys (described below) in which respondents living in Wisconsin's wolf range were assured of confidentiality and presented with statements about poaching wolves. Because the surveys and return envelopes were not identifiable and respondents could answer in privacy, we felt the truthfulness would be enhanced. We demonstrated previously in a general sample of respondents that there was internal consistency in the responses to that statement and that individuals who were later resampled remained consistent in their responses over time (Treves & Martin 2011; Treves et al. 2013). For each of three questionnaire items that follow, we offered five response options (strongly agree, agree, neutral, disagree, strongly disagree) and pooled strongly agree and agree for simplicity.

In 2009, 15% of deer hunters living in wolf range agreed with the statement, "If I were out hunting and saw a wolf I might shoot it" (25% of bear hunters agreed). Also we demonstrated that responses to this statement had shifted toward agreement an average of 1% per year from 2001–2009. Assuming the rate of change continued by the time of the present study (2011), the percent agreeing might have increased to 17% (27% among bear hunters). In addition, 24% of deer hunters selected the neutral response option (32% of bear hunters). The neutrals might be considered equally inclined to poach and not to poach. Therefore we set the bounds of our respondents' inclinations to poach wolves at 17–29% among deer hunters ($INCLINATION_{deer\text{-}hunters}$) and 27–43% among bear hunters ($INCLINATION_{bear\text{-}hunters}$). In 2001, the statement "I would

shoot a wolf if it threatened my pets", garnered 20% agreement (26% neutral) from a sample of 152 wolf range residents with high exposure to wolves but who were neither livestock producers nor bear hunters (sampling details in Naughton-Treves, Grossberg, & Treves, 2003). Among 171 livestock producers in that same sample, agreement was 19% (19% neutral) and among 188 bear hunters it was 13% (18% neutral). We never asked this question again in subsequent surveys nor did we ask a comparable question about livestock or hounds. As in the prior item, we assumed a 1% increase per year and a final range of values bounded by those agreeing (minimum) and added that estimate to half of those who had been neutral (maximum). Thus, we had 3 estimates for the inclination to poach wolves when their domestic animals were threatened among general pet owners, and livestock producers respectively, as follows: $\text{INCLINATION}_{\text{pet-owners}}$ = 30–44% and $\text{INCLINATION}_{\text{livestock-producers}}$ = 29–39%. For bear hunters, we had two estimates of inclination to poach a wolf (see above) so we used the minimum and the maximum estimates of both as our bounds for $\text{INCLINATION}_{\text{bear-hunters}}$ = 23–43%. We did not have a questionnaire item relating to threats to health and human safety. Thus we described these respondents' answers only.

Modeling potential to poach

Following the hypothesis in Figure 1 (main text), we operationalized potential to poach as follows:

Eq. 1: POTENTIAL-TO-POACH = INCLINATION • CAPABILITY • OPPORTUNITY

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To model the potential to poach a wolf, we multiplied the three frequency estimates as estimated above. We treated INCLINATION and CAPABILITY as independent because INCLINATION was estimated from our mail-back surveys from 2001–2009, whereas CAPABILITY was estimated from our telephone interview samples of individuals in 2011, both described above. We also treated OPPORTUNITY as independent because it reflected the frequency with which encounters with wolves occurred (not necessarily visual), i.e., it was set at 100% for verified complainants but self-reported by the deer hunter sample reporting on visual encounters and taking into account time spent in the field (see Eq. 2 below).

Our assumption of independence (multiplying the probabilities) is reasonable given our sources of data but may not hold under other conditions. First, a would-be poacher with strong intentions may seek additional opportunities (e.g., deliberate search for wolves to poach) or those who encounter many opportunities may change their attitudes (e.g., finding wolves more o less valuable as a result of experiences). We discuss the implications of this theoretical non-independence between intention and opportunity in the Discussion.

To operationalize Eq. 1 for our random deer hunters, we defined its components as follows:

Eq. 2: $\text{POTENTIAL-TO-POACH}_{\text{deer-hunters}} = \text{INCLINATION}_{\text{deer-hunters}} \bullet (A \bullet C) \bullet (F \bullet V)$

where the first parenthetical product represented CAPABILITY, and the second parenthetical product represented OPPORTUNITY. CAPABILITY was modeled as the

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product of A (the proportion of respondents who reported having access to a loaded weapon at the time of the encounter), and C (the proportion of those who believed they could have shot a wolf had they had a loaded weapon). The questions allowing us to estimate A were, “Did you have access to a weapon when you saw the wolf/wolves?”, “If yes, were you carrying it at the time you saw the wolf/wolves?”, and “If yes: Was it loaded?”. One might argue that some encounters lasted long enough for the respondent to fetch, load, and ready a weapon but we deemed this too speculative to add. The question with which we estimated C was, “Playing the scene back in your memory, do you think you might have been able to shoot the wolf or wolves that you saw immediately before, during, or immediately after this incident?” Although we asked how many wolves they might have shot (median 1, range 1–2), we chose to model poaching of a single wolf, because we assumed the others would usually escape after the first shot. OPPORTUNITY for deer hunters was modeled as the product of V (the proportion of respondents who ever reported a visual encounter with a wolf in response to the following question, “Have you ever seen wolves while deer hunting or preparing your hunting site?”) and F (the median number of visual encounters with wolves during a hunter’s self-reported career). We estimated F by responses to the question, “*If yes,* on how many different days have you seen wolves while you were deer hunting and/or preparing your site?” Because encounters were self-reported we did not restrict the deer hunters to reporting encounters prior to 2007 as in our complainant sample. Instead we asked, “When was this sighting/the most recent sighting?” and “How many

years have you been hunting deer?" so we could account for career effort. Although we report our respondents' assessments of the potential for their companions to have poached a wolf during the same encounter, we did not include that in Equation 2, as it seemed too speculative.

By contrast to our deer-hunter sample whose encounters were *not* verified independently, we treated our second sample as real encounters with wolves (OPPORTUNITY = 1.0) because of the verification procedure described above. Accordingly, we modeled POTENTIAL-TO-POACH for complainants as follows:

Eqs. 3–5: $\text{POTENTIAL-POACHING}_x = \text{INCLINATION}_x \bullet (A \bullet C)$

Where x is pet owners, livestock owners, or bear hunters, and each is presented in Results with its own equation.

RESULTS

Deer hunters

Among our random sample of deer hunters living in wolf range, 27 of 60 (V = 0.45) reported seeing wolves (n = 22 while hunting, n = 5 while preparing their site in the most recent events). The 27 respondents with visual encounters reported 1–42 such encounters in their hunting careers (median 2) and when asked, "When was this sighting/the most recent sighting?", the median response was the previous year (median last year, range 0–55) hence we estimated F = 1 because a median of 2 encounters every other year resulted in a median of 1 encounter per year. There was no

association between the response to, "How many years have you been hunting deer?" and whether they had seen wolves (median 40 years; range 2-49) or had not seen wolves (median 40 years, 6-73)— all were sampled from within wolf range. The durations of visual encounters were estimated at 2–900 seconds (median 30). Almost all of the 27 reported having had access to a weapon during the encounter (n = 3 bows), all said they were carrying it at the time, and almost all reported it had been loaded (including the 3 bow hunters) so we estimated A = 0.93 as the product of the two. When we included a 'maybe' response as 0.5, we found that 20.5 of 27 respondents thought they might have been able to shoot a wolf, so we estimated C = 0.76. The median number of wolves they believed they might have shot was one. Following Eq. 2,

$$\text{POTENTIAL-TO-POACH}_{\text{deer-hunters-minimum}} = 0.17 \bullet (0.93 \bullet 0.76) \bullet (1 \bullet 0.45) = 0.054$$

$$\text{POTENTIAL-TO-POACH}_{\text{deer-hunters-maximum}} = 0.29 \bullet (0.93 \bullet 0.76) \bullet (1 \bullet 0.45) = 0.092$$

In sum, 5.4–9.2% of deer-hunters from wolf range had the potential to poach a wolf each year by our model.

We asked deer-hunter respondents, "Did anyone else see the wolf/wolves before, during, or after the encounter?" and "*If yes,* were they armed with a loaded weapon?" The median number of armed companions who also saw the wolf was one (n = 18) whom they deemed capable of shooting the wolf in 8 cases (44%). When asked, "Were you concerned for your personal safety during your encounter?", 33% said 'yes'. Although the 27 deer hunters who had seen wolves appeared to be more likely to use concealments (100%) than those who had never seen wolves (87%), the role of

concealment is ambiguous in our data. At the time of the sightings, 38% of 27 deer hunters were not concealed *"…*when you sighted the wolf/wolves?" When asked, "*If concealed*, did the wolf/wolves seem to be aware of you presence?" 80% of deer hunters answered 'yes'. Also addressing conspicuousness of deer hunters, 33% answered 'yes' when asked, "Were you hunting alone or in a group?" (median 1, range 1–9 companions). "*If in a group,* was everyone in your group together, or within earshot of each other, during the wolf encounter?" (no = 2, yes = 6). "How would you describe your/your group's noise level immediately before seeing the wolf/wolves – quiet, moderate, or loud?" (n = 24 of 27, 88% reported 'quiet'). "Were there other hunters besides you/your group in the area that day?" (no = 9, yes =15, ? = 3). "Had you/anyone in your group/nearby fired a shot before the sighting?" (no = 26, yes = 1). "Did you harvest/wound any deer at that site in that season prior to seeing the wolf/wolves?" (no = 23, harvest = 3, wound = 0). "Were there any dead deer, dear gut piles, or deer skeletons in the area prior to that sighting?" (no = 21, yes = 3, ? = 1). "Were you aware of the wolf/wolves living nearby prior to the sighting?" (no = 3, yes = 21). "Was the land public access or private land?" (public = 10, private = 16).

Pet owners

We estimated A as 0.12 and C as 0.29. Following Eq. 3, we modeled

$$\text{POTENTIAL-TO-POACH}_{\text{pet-owners-minimum}} = 0.30 \bullet (0.12 \bullet 0.29) = 0.010$$

$$\text{POTENTIAL-TO-POACH}_{\text{pet-owners-maximum}} = 0.44 \bullet (0.12 \bullet 0.29) = 0.015$$

Hence 1–1.5% of pet owners with verified wolf complaints had the potential to poach as we have defined it.

When asked, "Were you concerned for your personal safety?", 1 of 17 (6%) of the pet owners answered 'yes'. Among pet-owners, 16 of 17 reported a single pet involved (n = 24 dogs total) in response to "How many of your pets were directly involved in this incident?" and six responded, 'yes' to "Were any other pets, yours or someone else's, in the vicinity during this incident?". Four respondents reported the incident took place on another property. These respondents believed that other persons might have shot the wolf in 22% of cases.

Livestock owners

For 61 livestock-owner respondents, A = 0.05 and C = 0.11. Following Eq. 4, we modeled

$$\text{POTENTIAL-TO-POACH}_{\text{livestock-owners-minimum}} = 0.29 \bullet (0.05 \bullet 0.11) = 0.0016$$

$$\text{POTENTIAL-TO-POACH}_{\text{livestock-owners-maximum}} = 0.39 \bullet (0.05 \bullet 0.11) = 0.0021$$

Hence our model predicted 0.2% of livestock owners with verified wolf complaints had the potential to poach.

For 61 livestock-owners responding to, "Where was/were the animal(s) located at the time of the incident?", we found refusal to respond = 1, barn = 1, enclosure = 6, pasture = 53, all three = 1. Livestock owners believed that other persons might have shot the wolf in 6% of cases. Among the livestock owners: "Were there any carcass dumps, including those used for road-kill deer, on your property or the surrounding

properties when this incident occurred?" (no = 55, yes = 5, ? = 2). "Were you on the farm at the time of the incident? (no = 15, yes = 40, ? = 6). "Were there dog(s) in the vicinity of the attack site?" (no = 40, yes = 20) and "I*f yes*, how many?" (one = 12, two = 4, three = 2, four = 1, twelve = 1) and "*If yes,* does it/do they usually bark when wildlife enter your property?" (no = 3, yes = 17) and "*If yes,* did they bark at the time of the incident?" (no = 2, yes = 17) and "If yes, did this warn you of trouble?" (no = 5, yes = 2). "Were there any signs or warnings [*other than dogs*] just prior to the incident?" (no = 49, yes = 9, ? = 3) and "Did you observe the animals' behavior change before the wolf appeared?" (no = 48, yes = 10, ? = 4).

Bear hunters

For the 29 bear-hunter respondents, A = 0.10, and C = 0.17. Following Eq. 5, we modeled

Eq.4: $\text{POTENTIAL-TO-POACH}_{\text{bear-hunters-minimum}} = 0.23 \bullet (0.10 \bullet 0.17) = 0.004$

Eq.5: $\text{POTENTIAL-TO-POACH}_{\text{bear-hunters-maximum}} = 0.43 \bullet (0.10 \bullet 0.17) = 0.007$

Hence our model predicted 0.4–0.7% of bear hunters who used hounds and had verified wolf complaints had the potential to poach.

For 29 bear-hunter respondents asked, "Did you see the wolf/wolves immediately before, during or immediately after the attack?", we found 'never' = 20, 'before' = 1, 'during' = 2, 'after' = 3 (multiple responses accepted). Additional situational details are presented in Supporting Information 1. 1.5 of 29 (5%) were concerned for their personal safety. These respondents considered that their companions might have

shot the wolf in 7% of cases. "Was the land public access or private land?" (public = 21, private = 4, mix = 3, ? = 1). "Did you (or your group) use bait at this site?" (no = 15, yes = 14). To the question, "Did this incident take place while training or hunting?" (training = 16, hunting = 13) and "*If hunting:* Which game animal(s) were you hunting?" (bears = 23, other = 3). "Were you hunting/training alone or in a group?" (alone = 2, group = 27). Were any other dogs, yours or someone else's, in the vicinity during this incident?" (no = 10, yes = 19, median 4 dogs, 1–78). "How much time had elapsed from when the dog was released to when it was attacked?" (15–30 minutes = 6, 30–60 = 9, >60 min = 12, ? = 2).

Complainants of health and human safety

For 8 complainants, A = 0.13 and C = 0.40. We did not model POTENTIAL-TO-POACH because we di not have an estimate of INCLINATION for these respondents (see Methods above). Five of eight complainants with health and human safety concern reported concerns for personal safety during our telephone interviews (63%). Apparently in the remainder, the verifier interpreted the incident as a threat to human health or safety or the respondent had forgotten that concern, although the official record we received was mute on the source of concerns. For these 8 situations, respondents answered the following question, "What activity were you engaged in during the incident?", husbandry (n = 3), by house (n = 3), other (n = 2). Of the six engaged in husbandry or by the house, four incidents occurred within 50 m of the complainant, and two occurred further away. Two respondents affirmed that pets or

livestock were involved in this incident (3 dogs, 1 chicken), suggesting half of these cases might be modeled as pet- or livestock-owners. The respondents believed that other persons might have shot the wolf in 16% of cases.

Effects on wolf population

From 15 March 2007 until 3 October 2011 (the time window we asked complainants to recollect), the State of Wisconsin verified 233 complaints about wolf attacks or threats to farm animals, 72 threats or attacks on hounds, 32 threats or attacks on pets, and 17 health and human safety concerns (WDNR annual records accessed through a Memorandum of Understanding with AT). If these incidents conformed to our respondents' self-reports, we expect that legalizing the killing of wolves under those complaint situations would result in approximately 1.5 wolves killed every 5 years. That estimate might double if one considered companions of respondents and their capability to poach more than one wolf per incident.

Acknowledgments

This research was funded by the U.S. Fish & Wildlife Service, Howling For Wolves, and the National Socio-Environmental Synthesis Center (SESYNC) - NSF award DBI-1052875.. Methods were approved by the Wisconsin Department of Natural Resources and University of Wisconsin Institutional Review Board for the protection of human subjects protocol SE-2011-0838.

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1. Dex, S. (1995). The reliability of recall data: A literature review. *Bulletin de Methodologie Sociologique, 49*, 58-80.

2. Mladenoff, D. J., Clayton, M. K., Pratt, S. D., Sickley, T. A., & Wydeven, A. P. (2009). Change in occupied wolf habitat in the Northern Great Lakes Region. In A. P. Wydeven, T. R. Van Deelen, & E. J. Heske (Eds.), *Recovery of Gray Wolves in the Great Lakes Region of the United States: an Endangered Species Success Story* (pp. 119-138). New York: Springer.

3. Naughton-Treves, L., Grossberg, R., & Treves, A. (2003). Paying for tolerance: The impact of livestock depredation and compensation payments on rural citizens' attitudes toward wolves. *Conservation Biology, 17*, 1500-1511.

4. Pearson, E. W., & Caroline, M. (1981). Predator control in relation to livestock losses in Central Texas. *Journal of Range Management, 34*(6), 435-441.

5. Ruid, D. B., Paul, W. J., Roell, B. J., Wideven, A. P., Willging, R. C., Jurewicz, R. L., & Lonsway, D. H. (2009). Wolf–human conflicts and management in Minnesota, Wisconsin, and Michigan. In A. P. Wydeven, T. R. Van Deelen, & E. J. Heske (Eds.), *Recovery of Gray Wolves in the Great Lakes Region of the United States: An Endangered Species Success Story* (pp. 279-295). New York: Springer.

6. Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley and Sons.

7. Thiel, R. P., Hall, W., Heilhecker, E., & Wydeven, A. P. (2009). A Disjunct Gray Wolf Population in Central Wisconsin. In A. P. Wydeven, T. R. Van Deelen, & E. J.

Heske (Eds.), *Recovery of Gray Wolves in the Great Lakes Region of the United States: an Endangered Species Success Story* (pp. 107-118). New York: Springer.

8. Treves, A., Jurewicz, R. L., Naughton-Treves, L., Rose, R. A., Willging, R. C., & Wydeven, A. P. (2002). Wolf depredation on domestic animals: control and compensation in Wisconsin, 1976-2000. *Wildlife Society Bulletin, 30*, 231-241.

9. Treves, A., Martin, K. A., Wiedenhoeft, J. E., & Wydeven, A. P. (2009). Dispersal of gray wolves in the Great Lakes region. In A. P. Wydeven, T. R. Van Deelen, & E. J. Heske (Eds.), *Recovery of Gray Wolves in the Great Lakes Region of the United States: An Endangered Species Success Story* (pp. 191-204). New York: Springer.

10. Treves, A., Martin, K. A., Wydeven, A. P., & Wiedenhoeft, J. E. (2011). Forecasting environmental hazards and the application of risk maps to predator attacks on livestock. *Bioscience, 61*, 451-458.

11. Wydeven, A. P., Wiedenhoeft, J., Schultz, R. N., Thiel, R. P., Jurewicz, R. R., Kohn, B., & Van Deelen, T. R. (2009). History, population growth and management of wolves in Wisconsin. In A. P. Wydeven, T. R. Van Deelen, & E. J. Heske (Eds.), *Recovery of Gray Wolves in the Great Lakes Region of the United States: an Endangered Species Success Story* (pp. 87-106). New York: Springer.