



Political affiliation predicts public attitudes toward gray wolf (*Canis lupus*) conservation and management

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Abstract

Controversial wildlife conservation and management, such as that involving gray wolves (*Canis lupus*), can be symbolic of broader social conflicts. We conducted an online survey ($N = 420$) to determine factors shaping public attitudes toward wolf management among residents of Washington state, United States. We used 12 Likert-type statements to form a single latent construct that represented attitudes toward wolf management in a multi-use landscape and fit a simple structural equation model to identify demographic predictor variables. The strongest predictors were that voters self-identifying as Democrats were more likely to hold positive attitudes toward wolves and management to conserve them than those identifying with other political parties (standardized latent variable coefficient = 0.585) and women were more likely than men to hold negative attitudes (-0.459). Older respondents were also more likely to hold negative attitudes (-0.015) and respondents who tried to stay informed about wolf issues were more likely to hold positive attitudes (0.172). Perceived links between wildlife management issues and political ideology may exacerbate community disagreements, hindering coexistence between rural livelihoods and wolves. We recommend appropriate framing and messengers to account for this linkage and improve communication of policy and promote science-based decision-making.

KEYWORDS

environmentalism, human-wildlife conflict, political partisanship, predators

1 | INTRODUCTION

Understanding differences in human world views is essential to fostering coexistence between wildlife and

people. Competing human ideologies shape preferences for how wildlife should be managed, so attitudes are essential to consider to understand and work to minimize conflict over wildlife conservation and management (Dickman, 2010; Pooley et al., 2017). This is especially true for conflict related to predators because conservation and management of these species is highly controversial and often politicized (Chapron & López-Bao, 2014; Pooley et al., 2017). In recent decades, there has been a change in attitudes toward predators in some societies,

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from seeking to eradicate them to an interest in restoring these species to areas from which they have disappeared (George, Slagle, Wilson, Moeller, & Bruskotter, 2016; Treves & Karanth, 2003; Williams, Ericsson, & Heberlein, 2002). This change is particularly apparent in Europe and North America, where control of large predators locally eradicated such species over the past few centuries. Today, conservation efforts are facilitating the return of large predators to modified, human-dominated landscapes (Carter & Linnell, 2016; Chapron et al., 2014). Real or perceived threats to human interests and the political and ideological conflicts associated with the return of wolves are important factors facilitating coexistence and thus governing conservation success (König et al., 2020; Treves & Bruskotter, 2014).

The case of the gray wolf (*Canis lupus*) is one of the strongest examples of political debates manifesting in predator conservation. In some parts of Europe, wolves are viewed as having been allowed to return because of societies' changing philosophies about what nature is and who or what belongs in the landscape (Buller, 2008). Rural societies often see the return of wolves as bringing about a reduction in their quality of life and even their communities' eventual demise (Skogen & Krange, 2003), a threat perceived to be imposed by a disconnected, romantic urban public. The conflict is about more than the wolves themselves, rather, it represents a deeper rift between societal values: "the wolf becomes the icon of urbanity", antagonistic to traditional rural lifestyles (Skogen & Krange, 2003: p. 320). Farmers (and hunters) feel cast aside by society, relabeled as villains, whereas the wolves are "symbolic heralds of a newly invigorated naturalness" (Buller, 2008:p. 1587). This conflict in ideologies has seen (illegal) killing of wolves become a symbol of protest, an act of resistance against governments that are perceived to have excluded the rural public from the broader public agenda and shifted favor toward middle class environmentalist interests (von Essen, Hansen, Nordström Källström, Peterson, & Peterson, 2015).

A similar scenario is playing out in the United States, where wolves represent changing public priorities in relation to appropriate land management, consumptive versus non-consumptive resource use, urban versus rural dichotomies, and political conflicts about property rights and federal versus state power (Bruskotter,ENZLER, & Treves, 2011; Hamilton, Lambert, Lawhon, Salerno, & Hartter, 2020; Wilson, 1997). Conflicts over these issues typically fall along the left-right political spectrum. Some (including politicians) see the recovery of wolves and their federal protection as an affront to rural cultures and an infringement on state authority (Bruskotter et al., 2011). This controversy became particularly conspicuous in the lead up to the reintroduction of wolves

into Yellowstone National Park and Idaho in the mid-1990s, which represented a major change in political will toward predators as well as appropriate land use and management more broadly, and the controversy remains strong. Some argue that decisions about wolf management, such as the delisting of the Northern Rockies Distinct Population Segment from the Endangered Species Act in 2011, have been shaped more by political agendas than by scientific evidence (Bergstrom, 2011; Bruskotter et al., 2011). Because wolf management is politicized, management and policy are susceptible to the whims of changing governments and have had to adjust with these cycles (Olson et al., 2015). Federal delisting of all gray wolves has been proposed recently by both Republican and Democrat administrations, and finally occurred in November 2020 under a Republican administration.

There has been extensive research conducted on public attitudes toward wolves and wolf management, particularly in the United States, dating back to the 1970s (Browne-Núñez & Taylor, 2002). An attitude is a disposition or tendency to respond favorably or unfavorably toward an object, concept, or behavior (Fishbein & Ajzen, 2010). Not surprisingly, research on attitudes suggests local contexts are important; that is, that people who are more likely to be affected by predators such as wolves (farmers, hunters, and rural residents) are more likely to hold negative attitudes toward predator conservation (Ericsson & Heberlein, 2003; Williams et al., 2002). Demographic variables have also been identified as useful predictors of attitudes toward predators and predator conservation, with older residents, women, and those with lower levels of education typically less supportive of predator conservation (Dressel, Sandström, & Ericsson, 2015; Kleiven, Bjerke, & Kaltenborn, 2004).

Public attitudes toward wildlife management issues are important. Members of the public may impact management participation in advisory boards, through backlash over actions or policy change, or through electing officials based on their wildlife-related policy stance. In the United States, some policy decisions are informed directly by ballot initiatives. For voters informed about the ballot issue, they may vote based on their attitudes toward the issue. Others may vote based on heuristic processing and basic beliefs that are linked with their broader social or political interests (Manfredo, Fulton, & Pierce, 1997; Sniderman, Brody, & Tetlock, 1991). For example, voter behavior may be influenced by prominent individuals or groups (e.g., political parties, conservation, or hunting organizations) expressing their preference for a particular policy or management outcome (Manfredo et al., 1997).

Because wolf conservation appears to be a politicized issue, we included a political dimension in our analysis. We employed a conservation psychology approach

(Bennett et al., 2017) to examine how individual attitudes toward wolf management may be informed by political affiliation. Political affiliation, or party identification, is viewed by some as a form of ideological social identity and has been found to be a predictor of attitudes toward political issues (Bartels, 2002; Huddy, Mason, & Aarøe, 2015). Social identity theory proposes that an individual identifies with a group based on their perception that the group shares their values, attitudes, and norms (Hogg, 2000; Hornsey, 2008). Individuals form stereotypes of “ideal” group members, providing a guide for how they should think and behave in relation to salient issues (Tajfel, 1978; Tajfel & Turner, 1979).

Consideration of political affiliation as an identity embeds our exploration of attitudes within the broader social context (Sjölander-Lindqvist, Johansson, & Sandström, 2015), linking with societal level changes in values relevant to environmental management (Dietsch, Teel, & Manfredo, 2016). Party affiliation is largely linked with political ideology, which is tied to values that shape policy-specific beliefs (Cruz, 2017; Jagers, Harring, & Matti, 2018). Left-wing values are broadly associated with solidarity and fairness, which extend to nonhumans (i.e., biocentrism), whereas right-wing views prioritize individual freedom, economic growth, and property rights (Czech & Borkhataria, 2001). Wolf conservation is controversial because wolves are symbolic of conflicting views on environmentalism. Left-leaning voters may have higher levels of environmental concern (Cruz, 2017) and prioritize wildlife over traditional Western utilitarian land uses such as hunting and grazing livestock (Czech & Borkhataria, 2001; Wilson, 1997). To right-leaning voters, wolf conservation may be viewed as an infringement on landowners' rights to manage their land or ranchers' rights to manage threats to their livestock, aligning with beliefs about land use rights, gun control, and “wise use” of natural resources (Wilson, 1997). In the United States, Democrats (left-wing) have historically placed greater value on environmental preservation than Republicans (right-wing), who have supported “wise use” and property rights movements (Czech & Borkhataria, 2001). As such, we expected that in a landscape where wolves impact ranching, respondents self-identifying with the Democrats would be supportive of wolf conservation whereas respondents identifying with a right-leaning party Republican would show less support for wolves.

We used a survey of the population of Washington state as a case study. Owing to heavy persecution by humans, wolves were functionally absent from Washington state for almost a century, but since the 1990s and early 2000s they have been returning naturally from Canada, Idaho, and Montana, and the first breeding pair was established in 2008 (Wiles, Allen, & Hayes, 2011). Wolf populations are

increasing in Washington and as of 2020, there were at least 21 established wolf packs comprising at least 145 wolves (37 of those on Colville tribal lands), mostly in the north-east of the state (WDFW et al., 2020, Figure 1). At the time of the survey wolves were protected under federal legislation in the western two-thirds of the state but delisted from the Endangered Species List in the eastern third (Wiles et al., 2011). They are listed as endangered under state law throughout the state (Wiles et al., 2011) but 23 wolves have been lethally removed by the state wildlife agency in response to attacks on livestock during 2016–2019 (WDFW et al., 2017, 2019, 2020) and some illegal removal has occurred (WDFW et al., 2019; Wiles et al., 2011). Public surveys reveal generally high support among Washington residents for wolf recovery, but there is a geographic division with stronger support in the mostly urban west of the state than the more rural east (Dietsch et al., 2016; Duda et al., 2008; Duda et al., 2014) that also corresponds with a Republican-Democrat voter divide (Figure 1). Based on the findings of previous studies (e.g., Dressel et al., 2015; Kleiven et al., 2004), we expected that (a) attitudes toward wolves would be more negative among older people, women, those with a lower level of education, and those living in closer proximity to wolves, and (b) that left-leaning political affiliations would be associated with support for wolf conservation (Hamilton et al., 2020; Tulchin & Krompak, 2013).

2 | METHODS

2.1 | Survey creation and distribution

We developed an online survey on the Qualtrics® platform to measure the attitudes of Washington residents toward wolf conservation and management. The survey included 12 five-point Likert scale statements (Figures 2 and 3) pertaining to wolf management in a multi-use landscape, comprising items capturing attitudes toward wolves, ranching, wolf-livestock coexistence, and wolf management methods (i.e., lethal control). These statements were developed for this study because we considered that there were competing interests associated with ranching and wolf management in the state and we aimed to identify the degree to which citizens valued wolves and ranching and explore how demographics and political inclination were linked with attitudes toward wolf management. We also collected information on respondents' demographics, geographic location in relation to wolf packs, and political affiliation. The latter was measured by asking which of Democrat, Republican, Independent, or Libertarian best described respondents' political inclination. The items analyzed here were part of a larger survey effort that aimed to assess the public's

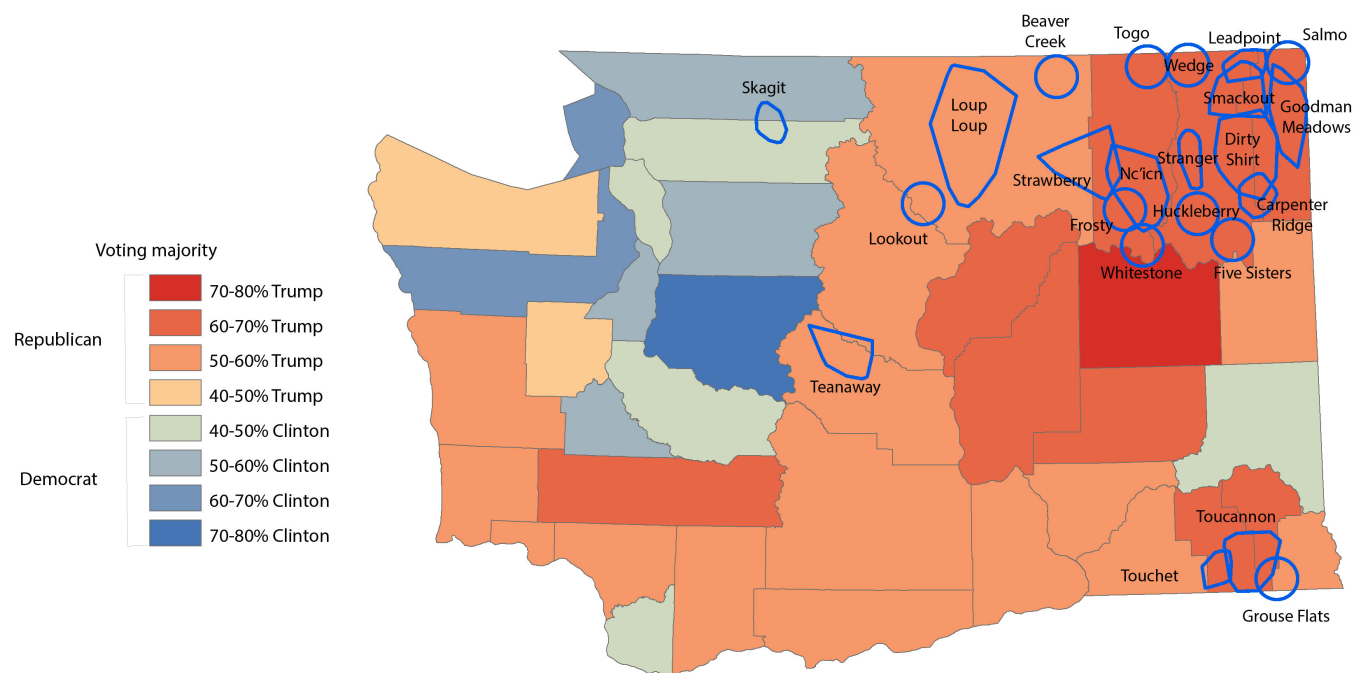


FIGURE 1 Majority votes per county for the 2016 presidential election and location of known wolf packs in Washington state (blue lines with pack names in black). Polygons represent estimates of pack home ranges based on multiple known locations and circles represent generic representations of home ranges based on single locations. Majority Republican (candidate: Donald Trump) voting counties are displayed in red and majority Democrat (candidate: Hillary Clinton) voting counties are displayed in blue, with a darker red or blue color indicating a stronger majority. Wolf pack information was obtained from the Washington Department of Fish and Wildlife and voting results were obtained from AP/Politico

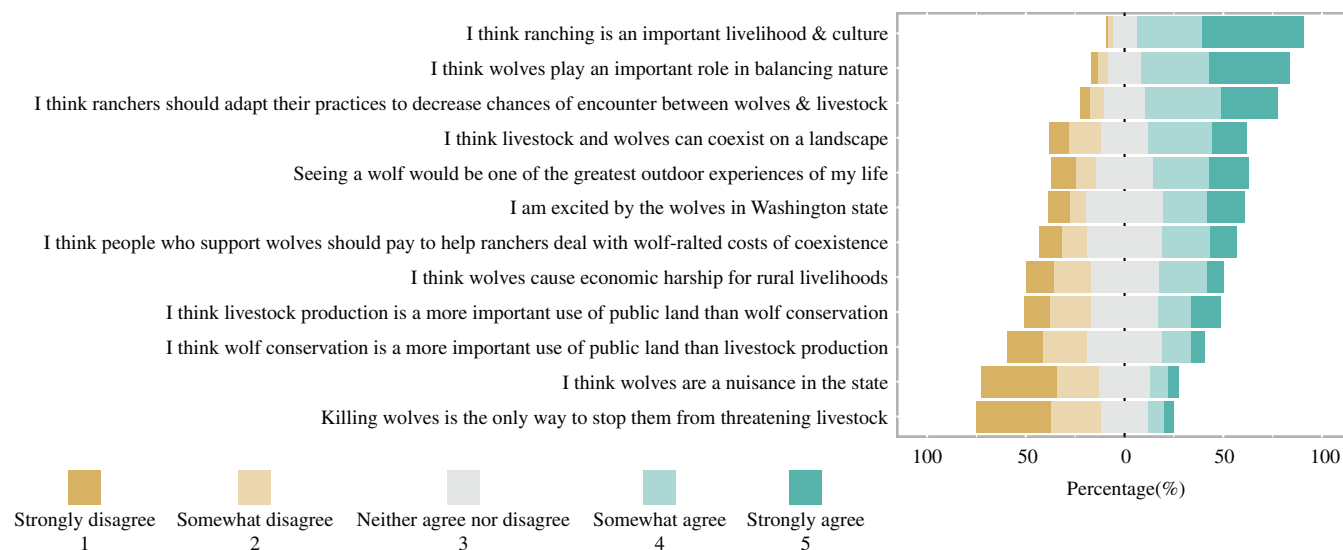


FIGURE 2 Participants' percentage responses to 12 statements about wolves and ranching in Washington state

preferences for mitigation strategies and identify alternative sources of funding for improving the state of wolf conservation and human-wolf coexistence in Washington. We developed the survey instrument with input from environmental and social scientists and pre-tested it by an online pilot study.

We distributed the survey via a market research company (GfK) in April and May 2017 using GfK's KnowledgePanel®. According to GfK, KnowledgePanel® is the largest fully representative sampling frame for the United States, comprising members that are selected using probability-based sampling aimed to be

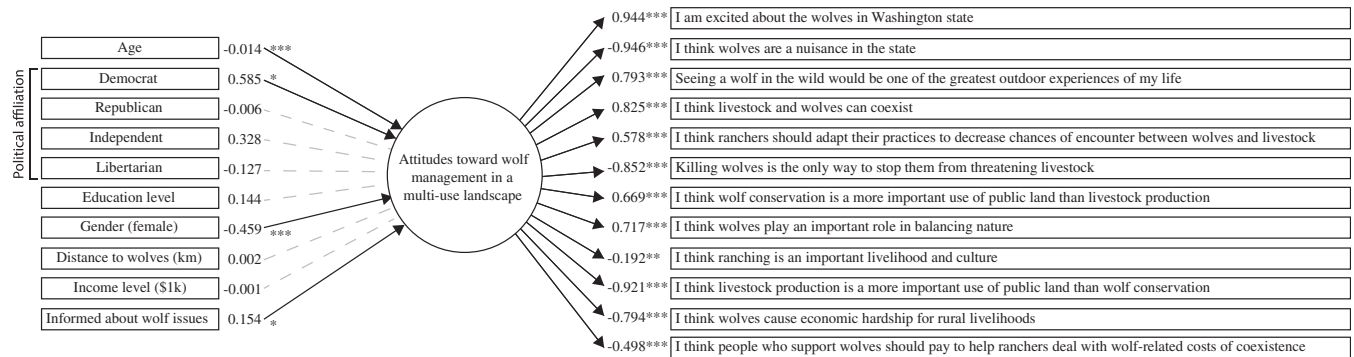


FIGURE 3 Structural equation model for single latent variable representing attitudes toward wolf conservation using maximum likelihood estimators (RMSEA = 0.037, CFI = 0.896, $N = 401$, $df = 186$). Coefficient estimates for the predictor variables and loadings for the factors contributing to the latent variable are based on standardized latent variables. Significant relationships between predictor variables and the latent variable are indicated by *** $p < .001$, ** $p < .01$, * $p < .05$. Nonsignificant relationships are indicated by gray dashed lines

TABLE 1 Standardized latent variable coefficient estimates of demographic variables predicting Washington residents' attitudes toward wolf conservation

Item	Mean \pm SE or percentage		Latent construct		
	Unweighted	Weighted	Standardized latent variable	Z-value	p
Age (in years)	55.65 \pm 16.28	48.25 \pm 1.81	-0.014	-3.905	<.001
Votes Democrat	28.81%	27.52%	0.585	2.411	.016
Votes Republican	22.62%	25.34%	0.015	0.061	.952
Votes Independent	40.71%	40.63%	0.328	1.343	.179
Votes Libertarian	5.24%	6.50%	-0.127	-0.335	.738
Education level (\geq Bachelor's degree)	41.90%	33.05%	0.144	1.163	.245
Gender (is female)	46.23%	51.16%	-0.459	-3.924	<.001
Distance to wolves (in km)	105.34 \pm 2.41	103.51 \pm 5.15	0.002	1.676	.094
Income level (in \$1000s)	75.57 \pm 2.98	90.29 \pm 7.13	0.001	1.489	.136
Informed about wolf-issues (scale 1–5)	2.62 \pm 0.06	2.55 \pm 0.14	0.154	2.554	.011

Note: Data included in the analysis were weighted to achieve representativeness based on the most recent United States Census Bureau Current Population Survey.

representative of the U.S. public (The GfK Group, 2013). To improve sample representativeness further, responses for this study were weighted post-survey to achieve a sample representative of Washington state population demographics using weights provided by GfK based on the most recent U.S. Census Bureau Current Population Survey (see Table S1). GfK incorporates factors such as gender, age, ethnicity, education, household income, home ownership status, census region, and location in a metropolitan versus non-metropolitan area to calculate the weights.

2.2 | Analysis

We calculated Cronbach's alpha in R (R Core Team, 2020) to assess the reliability of the 12 Likert-type items

measuring attitudes toward wolves, reversing scores for statements with opposing sentiments ($\alpha = 0.79$). We fit a structural equation model (SEM) based on full information maximum likelihood criteria to a single latent construct formed from these 12 items (Figures 2 and 3) and predictor variables including age, gender, distance to wolves, education level, income level, level of interest in wolf-related issues (measured by the statement "I try to stay informed about current events surrounding wolves in Washington"), and political affiliation (Figure 3). Political affiliation was included as four indicator variables representing the respondents who aligned with each of the four categories (Democrat, Republican, Libertarian, Independent), with an omitted category for "other" political affiliation. We considered a maximum likelihood-based root mean square of approximation (RMSEA) less than or close to 0.06 and comparative fit index (CFI) greater than or close to 0.95 as

indicative of good model fit (Hu & Bentler, 1999). Given that our data are from a research panel with provided post-stratification weights, those need to be accounted for in SEM estimation. This analysis was conducted using the “lavaan” and “lavaan.survey” packages in R (Oberski, 2014; Rosseel, 2012). We report descriptive statistics comparing political affiliation with the other demographic information included in the model.

We also tested a SEM with two latent variables by splitting the 12 statements into categories representing attitudes toward wolf conservation and attitudes toward ranching but rejected this option as it presented a lower fit than the single latent variable model ($\chi^2[115] = 707.38$, $p < .001$) and because of the high negative correlation between these two variables (standardized latent variable coefficient = -0.844 , $p < .001$).

3 | RESULTS

In total, we obtained 420 responses (667 invitations sent, 63% response rate) but 19 were excluded from the SEM due to missing data. The sample comprised 46.23% women and the average age of respondents was 55.65 ± 16.28 years (range 18–94, Table 1). The average distance between a respondent and a wolf pack was 105.34 ± 2.41 km. While 11 respondents (2.62%) did not state a political affiliation, the remainder described their affiliation as Independent (40.71%), Democrat (28.81%), Republican (22.62%), or Libertarian (5.24%, Table 1). Considering the items included in the latent construct, most respondents either somewhat or strongly agreed that wolves play an important role in balancing nature (75.06%), that ranchers should adapt their practices to prevent encounters between wolves and livestock (66.67%), that ranching is an important lifestyle and culture in Washington (84.34%), and somewhat or strongly disagreed that wolves are a nuisance in the state (59.76%).

We considered the fits for the weighted single construct SEM ($\chi^2[164] = \text{RMSEA} = 0.037$, $\text{CFI} = 0.896$) to be acceptable. The SEM identified that Democrat-voters held positive attitudes (standardized latent variable coefficient = 0.585 , $p = .016$) and women held negative (-0.459 , $p = .002$) attitudes toward wolf conservation (Figure 3, Table 1). Positive attitudes toward wolf conservation increased with interest in wolf-related issues (0.154 , $p = .011$) and decreased with age (in years; -0.014 , $p < .001$). All other regression estimates were nonsignificant at the $p = .05$ level but distance from wolves appeared to be slightly positively correlated with attitudes toward wolves (0.002 , $p = .094$).

4 | DISCUSSION

We explored factors shaping Washington residents' attitudes toward wolf management in a ranching landscape. We found that political affiliation, specifically whether a respondent voted Democrat, was the strongest predictor of attitudes toward wolf management, followed by gender. Democrats were more likely to favor wolf management that conserved wolves, but importantly, no significant relationship was observed for the other three voting categories, with support for wolf conservation generally moderate to high (Figure 2, Table 1). This pattern of attitudes toward wolf management is consistent with previous research; for example, voter polls identified stronger support for wolf restoration among people who vote Democrat (74, 82, and 82% support, respectively) than those who vote Republican (58, 51, and 61% support, respectively) in the states of California, Oregon, and Washington (Tulchin & Krompak, 2013). Indeed our findings are supported by a recent study by Hamilton et al. (2020) who found that socio-political identity in Oregon was a stronger predictor of support for wolf management than other demographic factors, with Republican-voters and Tea Party supporters more likely to be in favor of removing wolves than Democrat- and Independent-voters. Whereas political affiliation has been linked to attitudes toward wolves in the United States and Europe (e.g., Nie, 2003; Skogen & Krange, 2003; von Essen et al., 2015), socio-political identity as a synthetic measure has been lacking in research on public attitudes towards wolf conservation, meaning that our study and that by Hamilton et al. (2020) are the first to identify political affiliation as a useful predictor of public attitudes toward predator management. The findings of these two studies in neighboring states suggest that political affiliation and identity should be an important consideration in planning, implementing, and communicating about wolf conservation and management in the Pacific Northwest. However, while we identified that a posited relationship exists, we do not make a much stronger claim that political affiliation causes attitudes toward wolves to change.

The second strongest predictor of attitudes toward wolf management was gender, with women less likely to support conservation. Older respondents were also less likely to hold pro-wolf attitudes whereas people who lived farther from wolves and those who tried to stay informed about wolf issues were more likely to hold pro-wolf attitudes. In some western societies, among the older generations there tends to be a sense that things are getting worse than they were in the old days (Inglehart, 2018) in this case it could be remembering the decades gone when individuals had more direct control

over wolf management. Finding that women, older people, and people who live closer to predators are less likely to hold positive attitudes toward predator conservation is supported by previous research in the United States (Kellert, 1985; Williams et al., 2002) and Europe (Dressel et al., 2015; Kleiven et al., 2004). Given that other studies have identified that attitudes toward predators become more negative the longer people live in proximity to them (Dressel et al., 2015; Gosling, Bojarska, Gula, & Kuehn, 2019), and that we found that proximity to wolves was inversely related to positive attitudes, we might expect attitudes to become more negative as wolves continue to establish in Washington. Yet, recent studies have shown that attitudes toward wolves in the United States have become more favorable (George et al., 2016; Hamilton et al., 2020) and that public values are becoming more eco-centric and less anthropocentric with regard to conservation (George et al., 2016; Manfredi, Teel, & Dietsch, 2016). In Washington, the relationship between distance from wolves and attitudes toward them may be driven by a link between distance from wolves and political affiliation, with Democrat voters living primarily in urban areas (Figure 1). Whether distance to wolves or political affiliation is more important in predicting attitudes toward wolf management in Washington can be explored as wolves continue to recolonize the state, making it an important case study to examine in coming years.

4.1 | Implications for policy and management

Recognizing the political nature of conflict surrounding wolves is important for working with stakeholders and developing effective coexistence strategies between humans and carnivores. Stakeholders holding anti-wolf sentiments present an obvious challenge to wolf conservation but opposing pro-wolf attitudes can also exacerbate perceived human-wolf conflict. For example, where biocentric philosophies (linked with left-leaning ideologies, Czech & Borkhataria, 2001) overshadow science-based conservation objectives or where communicators impose dominant pro-wolf sentiments on management issues that affect a small proportion of the (mostly rural) population (Williams et al., 2002). This is an important reminder that wolf conservation advocates (including scientists) should be mindful of their own positionality in the wolf debate and the ideologies (political or otherwise) that they hold, or are perceived to hold, that shape this position and their role in addressing conflict (Redpath et al., 2013). Any communication that promotes wolf conservation should be sensitive to the concerns and

objections raised by opposing parties, acknowledging the risks of coexistence with carnivores (Bruskotter & Wilson, 2014).

Wildlife conservation typically aims to restore populations to levels at which they are no longer considered to need protecting (Slagle, Dietsch, & Bruskotter, 2019) and state delisting of wolves in Washington is likely to occur as wolves spread further west into majority-Democrat areas. Wolf advocates (who here are likely to be Democrats) may object to delisting wolves when wolves are considered recovered in the state as delisting would remove some restrictions on lethal control. As such, understanding how to manage differences in attitudes, and any corresponding behaviors, is important for achieving science-based management. Our study helps inform this by highlighting the importance of conflicting ideologies in shaping attitudes toward wolf management, as an understanding of the values associated with these ideologies can be used to inform conflict mitigation and communication strategies.

In some regions of the U.S. there are opportunities for the public to contribute to wildlife management policy decisions through direct democracy mechanisms such as ballots (Jacobsen, Organ, Decker, Batcheller, 2010), and in Washington, a wolf advisory group, comprising members that represent a range of stakeholder groups, shapes decisions about wolf management and conservation (see wdfw.wa.gov/about/advisory/wag). Both the left- and right-leaning sides of the political spectrum influence these decisions, so both must be understood and acknowledged to form lasting solutions to controversial problems.

Political affiliation has been identified as a strong predictor of attitudes toward environmentalism overall (McCright, Xiao, & Dunlap, 2014) as well as specific issues such as climate change (Hornsey, Harris, Bain, & Fielding, 2016). Contemporary partisanship of environmentalism is not unique to the United States; indeed, environmentalism is similarly divided between liberal and conservative political groups in other Western nations (Dalton, 2009). Given that positive perceptions of wolves and their conservation are aligned with voting Democrat, we might learn from the successes and failures of partisan issues like climate change. Without appropriate framing, provision of information about partisan issues may be unlikely to change attitudes because each side filters the information to suit their political agenda (McCright & Dunlap, 2011). Schkade, Sunstein, and Hastie (2010) showed that deliberation over an issue among groups of like-minded individuals led to further polarization in their beliefs. Specifically relating to wolves, Meadow, Reading, Phillips, Mehringer, and Miller (2005) found that, instead of changing opinions, access to information about wolves further polarized attitudes.

Messages from the political elite have been identified as the most important factor influencing public opinion on climate change, trumping science communication in the media (Brulle, Carmichael, & Jenkins, 2012). The influence of the political elite is strongest for moderately informed voters who are most likely to be exposed to political messaging than disengaged voters and are more likely to be persuaded than highly informed voters (Karp, 1998). This is especially important for ballot initiatives, where cues from partisan elites not only influence how voters vote, but whether they participate in ballot initiatives at all (Lewkowicz, 2006). This means that messaging from political elites could shape the outcomes of ballot initiatives on wolf management, indeed, support and opposition for some wolf conservation proposals appears to be split across the partisan divide among politicians in Washington (Bogezi, van Eeden, Wirsing, & Marzluff, 2019). Drawing from social identity theory, identifying trusted, and in-group messengers is important for targeting specific groups. If the goal is to facilitate wolf management that may include lethal control, political elite messengers who align with the Democrats may be more likely to draw support for the issue among (typically pro-wolf) Democrat voters than messengers who align with Republicans or Libertarians, and vice versa for wolf conservation initiatives.

Because liberal political ideologies are linked with exhibiting mutualist wildlife value orientations (Bright, Manfredo, & Fulton, 2000), liberal voters may be persuaded by arguments to protect wolves based on the wolves' intrinsic value or animal rights concerns, whereas more conservative voters may support wolf management that aligns with utilitarian values, such as providing recreational hunting opportunities. Research on communicating climate change has suggested using an economic development framework that appeals to conservative voters (e.g., that renewable energy technology presents opportunities for new industries; Nordhaus & Shellenberger, 2007). Framing wolf conservation using nonmarket valuation is an approach already taken by some conservation organizations to emphasize the economic benefits that wolves might bring through tourism and provision of ecosystem services (e.g., see Edge et al., 2013). Non-consumptive wildlife use has grown in recent decades (Decker et al., 2017), and since the reintroduction of wolves into Yellowstone National Park, wolf-based tourism (e.g., visiting the park hoping to see wolves) is estimated to have contributed more than USD 35 million annually to the surrounding states (Duffield, Neher, & Patterson, 2008)—although tolerance for wolves among neighbors may not have increased. However, evidence of the relationship between financial benefits, such as those brought by ecotourism, and local tolerance for wildlife is mixed (Walpole & Thouless, 2005)

and we are not aware of any studies that have directly measured how nonmarket valuations of predators have shaped stakeholder attitudes. While wolves reduce ungulate population that could negatively impact forestry through overgrazing and browsing, it is also important to recognize that proposing to reduce ungulate populations may conflict with the demands of hunting tourism and local communities (Conover, 1997).

4.2 | Conclusion

Attitudes toward wolves that are strongly linked to political ideology in either direction can be damaging to achieving evidence-based wolf conservation and management. Left-leaning proponents with biocentric philosophies may lose sight of ecological science in decision-making about wolf management in favor of concern for individual wolves (Czech & Borkhataria, 2001). Many affected rural communities view wolf conservation supporters as disconnected urban elites imposing conservation agendas on rural land management, negatively impacting rural livelihoods and economies (Skogen & Krange, 2003; Wilson, 1997). Wolf advocates dismissing these concerns as archaic, anti-environment, or anti-science because of perceived differences in their own ideologies will only exacerbate conflict surrounding wolf conservation and management actions. We should note that although Democrat-affiliated voters held the strongest pro-wolf attitudes, attitudes of voters of other political affiliations were not symmetric in opposition to wolf conservation, which suggests the possibility of conservation and management policies that can bridge partisan divides. Likewise, respondents generally regarded ranching as an important livelihood and culture regardless of political affiliation, so there is likely public support for ranchers who are affected by predators.

This study, combined with findings by Hamilton et al. (2020), suggest that political affiliation as more important than other demographic factors (such as proximity to wolves) in predicting support or opposition to wolf conservation in the Pacific Northwest. As such, this region presents a unique opportunity to track changes in public attitudes toward wolves as wolves begin to recolonize wolf-friendly Democrat-voting areas. At the same time, as wolves expand into western Washington, protections will likely be reduced because populations are deemed sufficiently recovered, so whatever the future of Washington wolf management holds, effectively communicating management goals to audiences with differing attitudes towards wolves is necessary to promote evidence-based action. While we see that political partisanship affects pro-wolf attitudes in Washington State,

and past wolf management conflicts have been in part framed as a partisan issue, we identify an important pro-wolf asymmetry in a careful study of the general population. In particular, we did not find strong negative partisanship effects against wolves (or against ranching) which should be a useful platform for audience segmentation in developing appropriate messaging (Kidd et al., 2019) to support effective evidence-based management of wolves in the State.

Conservationists globally are recognizing the importance of drawing on diverse disciplines to support evidence-based management of controversial species in human-dominated landscapes (Carter & Linnell, 2016; König et al., 2020). The social sciences are necessary to understand social processes and the various factors shaping individual attitudes and behaviors that influence conservation outcomes (Bennett et al., 2017). In addition to informing communication strategies around contemporary wolf management issues, we hope that this study provides a platform for deepening our understanding of the dynamics of social factors in shaping public attitudes toward predator conservation and management. Revealing the importance of political affiliation in the wolf debate will remind conservationists to consider their target audience and appropriate framing in conflict mitigation and communication strategies.

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CONFLICTS OF INTEREST

The authors declare no potential conflicts of interest.

AUTHOR CONTRIBUTIONS

Carol Bogezi, Sergey Rabotyagov, and John Marzluff designed and conducted the survey. Lily van Eeden, Sergey Rabotyagov, and Morgan Kather led the statistical analysis. Lily van Eeden led writing of the manuscript, while all authors contributed to interpretation of the results, provision of critical feedback, and writing and editing of the manuscript.

ETHICS STATEMENT

This study was conducted with the approval of the University of Washington's Internal Review Board (HSD study #52322).

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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