

Conservation reliance and its influence on support for carnivore recovery

Christopher Serenari 

Department of Biology, Texas State University, San Marcos, Texas

Correspondence

Christopher Serenari, Human Dimensions of Wildlife, 316 Supple Science Bldg., Department of Biology, Texas State University, San Marcos, TX.
Email: c_s754@txstate.edu; URL: <http://www.serenarilab.com>, @serenarilab

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Abstract

The number of species reliant on consistent human intervention is rising. These species are labeled conservation-reliant, which affords them unique resources to propagate them. A conservation reliance designation has important implications for recovery of large carnivores, particularly where private lands encompass historical ranges. As a policy tool, a conservation reliance designation may be used in conjunction with other popular instruments such as financial incentives or co-governance to promote coexistence between carnivores and key cohorts such as landowners and hunters, who are often vocal dissidents of carnivore recovery, especially wolf recovery projects. Yet, the nascent literature on conservation reliance has yet to address the influence of conservation reliance on landowner or hunter support for carnivore conservation. This paper fills this gap with an analysis of responses from 639 landowners to explore the influence of a conservation reliance designation on intention to coexist with wild red wolves (*Canis rufus*) in northeast North Carolina. Findings suggest that respondents living in the red wolf recovery zone generally oppose a conservation reliance designation, a critical means to red wolf recovery. Hence, a conservation reliance designation may actually erode the value of some species they intend to preserve. Disapproval of conservation reliance poses new confronts to restoration politics and its diversity of strands, which must be woven into new ways of thinking about the ethical and political aspects of carnivore policy and management.

KEYWORDS

carnivore; Conservation reliance; North Carolina; policy tool; private lands; wolf

1 | INTRODUCTION

The grand social, ecological, and climatic challenges of our day have contributed to the rise of threatened and endangered species. Pressures on these species are unceasing because humans have fundamentally altered

Earth's composition, structures, and functions and the integrity, diversity, and health of biodiversity (Goble et al., 2012). To halt ecological collapse, humans have tapped into a collective environmental consciousness and primarily intervened through state-sponsored management. In particular, societies have placed much faith in

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sweeping legislation and accompanying technical policy to restore select species and ensure their long-term survival. However, the assumption that these instruments of governance alone are enough to reverse negative outcomes for wildlife has been resoundingly invalidated because of the need for and challenges to recovery and postrecovery management (Scott & Goble, 2006). In many countries, species unavoidably facing human threats and extinction are considered conservation-reliant.

A conservation reliance designation is included within the broader framework of carnivore governance. Conservation-reliant species are broadly defined as those that require constant or intensive human intervention and management to survive. Concrete definitions have been debated in the literature, centering on North America and mainly focusing on the role of delisting species under the U.S. Endangered Species Act (ESA). Conservation reliance may be more commonplace nomenclature in the U.S., however, the phenomenon of conservation-reliant species is global (e.g., red deer [*Cervus elaphus*, Skog et al., 2009], manatee [*Trichechus manatus manatus*, Luna et al., 2012]; kakapo [*Strigops habroptilus*, Seddon, 2011]). After revising their initial definition, Goble et al. (2012, 2014) maintained a delisting approach. They argued that the listing-delisting binary under the ESA is associated with risk of extinction and, resultantly, the need for “species-specific assurances” (Goble et al., 2012, p. 870) via a plan outlining the stages of recovery (see Scott et al., 2005) and species-specific management tools.

Adhering to the ESA's emphasis on self-sufficiency in the wild in the absence of human intervention, Rohlf et al. (2014) proposed conservation reliance as a spectrum. They proposed that declaring a species “secure” should be firmly based on biological indicators. Projections of security are also integral to their definition. Goble et al. (2014) responded that a secure determination is a policy decision underpinned by risk tolerance and legal mandates, which requires the absolutes of the here and now, and not prognostications. Wildlife agencies may employ less restrictive definitions of conservation reliance. For instance, the U.S. government, including the Fish and Wildlife Service (USFWS), has not codified the term, normatively discussing “intensive management” via habitat management or use of control measures (e.g., parasitic control). Rodewald (2016), who cautioned against the lackadaisical use of the term, concluded that “words do matter” because they shape conservation outcomes (p. 13). Rodewald (2016) observed that political and legal domains are salient to the operationalization of conservation reliance and attended to the politicization of the term to undermine species conservation efforts. Four years earlier, Goble et al. (2012) mentioned landowners'

reluctance to engage, bureaucratic formalities, requisite resources, and dissent associated with conservation reliance. To date, researchers have yet to undertake a rigorous integration of critical social dynamics into conservation reliance definitions and debates.

A conservation reliance designation has important implications for recovery of large carnivores on private lands. Public lands were not designed to be arks or promote genetic connectivity, nor are they abundant or legally bound to carry the weight of conservation reliance. Hence, the future of carnivore recovery in the U.S. will necessitate that private landowners stop fighting it. This is particularly the case where private lands comprise vast portions of native ranges (e.g., red wolf [*Canis rufus*]) or private lands are required to ensure genetic viability (e.g., Mexican wolf [*Canis lupus baileyi*], grizzly bear [*Ursus arctos horribilis*]). However, conservation reliance can have a negative connotation that turns private lands into battlegrounds. For wolf advocates, the term implies a level beneath the ideal type wild carnivore. Put more simply, if it is not wild, then it is second-rate or unnatural. For instance, in a 2017 letter to the USFWS, Mike Phillips argued on behalf of the Turner Endangered Species Fund that excluding private lands in the Mexican wolf draft recovery plan would “pigeon-hole” the species as conservation-reliant. In the case of resistance to wolf recovery, research suggests “artificial” introduction is a topic worthy of research because of a perceived inferiority to natural recolonization (e.g., Fox & Bekoff, 2011; Schoenecker & Shaw, 1997). Evidence from red wolf recovery in North Carolina signaled that conservation reliance is not acceptable among some wolf recovery critics because it violates the natural order (Serenari et al., 2018). Given that the conservation reliance concept is here to stay, it is necessary to explain its effect on support for carnivore recovery and, ultimately, coexistence or sharing space with carnivores. Yet, there is insufficient literature within the conservation social sciences about the influence of conservation reliance on public support for carnivore conservation and the implications of this relationship.

The aim of this paper is to fill a gap in our understanding about how a pseudoformal conservation reliance designation impacts support for carnivore recovery on private lands. Broadly, this exploratory study investigates the relationship between baseline support for wild wolves (support for wolves independent of a conservation reliance designation), support for conservation-reliant wolves (i.e., using a conservation reliance designation as a policy tool), and intention to share space with carnivores. We use the case study of red wolves in eastern North Carolina to investigate these interactions and lay a foundation in which future research can further consider

the role of this influential designation in wildlife conservation. In doing so, we can assign meaning to the designation among the public, refine definitions of the conservation that integrate social dynamics, and uncover hindrances to and drivers of sustainable carnivore governance.

1.1 | Instrument choice theory

The instrument-choice perspective is essential to regulatory management (Hill, 2005). Instrument choice represents the larger framework of design, logic, strategies, tools, and tactics essential to the governance model in use. Instruments of governance are broadly defined as “initial shapers of behaviour in policy settings,” but “potential shifters of ongoing processes of policy action over time” is preferred (Bressers & O’Toole, 2005, p. 133). They are structural interventions designed to meet programmatic goals. Instruments stem from and reflect the dynamics of the broader policy context (Howlett, 2009) and can include the abstract and material constructs such as reputation, agreements, property rights, or laws (Al-Najjar, 1995).

In carnivore contexts, wildlife authorities have a number of instruments from which to choose. Their instrument context is often underpinned by a system of ideas or ideology. For example, the bedrock of the contemporary wildlife management institution in North America is the North American Model of Wildlife Conservation and its cornerstone, the Public Trust Doctrine (Smith, 2011). From here, we can trace the lineage of popular instruments replicated and deployed in global carnivore governance. Tactical policy, often and perhaps inappropriately labeled as management strategies, is a necessary means to achieve conservation targets. Most boil down to employing methods with varying degrees of aggressiveness. Carnivores may be deterred with non-lethal and lethal means (Boronyak et al., 2020), while no action may also be a viable policy option (Dar et al., 2009; Dickman, 2012).

A conservation reliance designation is a tactical policy, but its influence on intention to coexist with carnivores is understudied. Viewed positively, Kavanaugh et al. (2013) found value in the term for educational purposes and setting technical and ethical expectations among the public concerning grizzly bears. Yet, operationalizing conservation reliance is often a complex and sometimes messy business. The tools at the disposal of managers will vary and combinations of them are regularly required to meet conservation goals. Scott et al. (2010) identified five conservation management strategies that support conservation reliance: control of

direct and indirect human impacts, artificial recruitment, active habitat management, and control of other species. Scott et al. (2005) and Goble et al. (2012) identified examples such as invasive or non-native species control, use of prescribed fire to maintain suitable habitat, grazing or public access restrictions, predator control, planned dam releases, assisted migration, and captive-rearing with wild release. To maintain genetic viability, socially disagreeable control measures may be taken as well. Such is the case with red wolves and northern spotted owls (*Strix occidentalis caurina*), whereby hybrid wolf-coyote (*Canis latrans*) pups and spotted-barred (*Strix varia*) owlets are euthanized or sterilized, respectively (Livezey, 2010; Stoskopf et al., 2005). Additionally, not all species will be wild once again and some will remain in captivity (Scott et al., 2010), perhaps designated as zoo curiosities or breeding stock.

Theoretical Model Development.

The focal variables in the theoretical model (Figure 1) draw from findings suggesting how demographics and hunting activity influence support for and intention to share space with carnivores. The first and second hypotheses tested here assert that demographics will influence change in support for conservation-reliant wolves (H1) and intention to coexist with wolves (H2), respectively. Those completing higher levels of formal education have generally positive attitudes and, depending on the context, gender and income can reflect positive or negative attitudes toward carnivores (Williams et al., 2002).

The third and fourth hypotheses highlight the possibility that hunting activity will influence support for conservation-reliant wolves (H3) and intention to coexist (H4). Researchers suggest that support for carnivores ranges from negative to positive (Treves et al., 2013; Williams et al., 2002) depending on the context, but hunters, a politically influential group when it comes to carnivore and private lands conservation, are often vocal dissidents of carnivore recovery, especially wolf recovery projects (Mattson, 2014; Nie, 2004; Vucetich et al., 2017).

Beliefs about the foundation of conservation reliance such as captive breeding and controlling impacts underpin ideology and may also influence intention to coexist and support for conservation-reliant wolves. Reviewing various internet sources and documents revealed hunters and their supporters may prefer natural recolonization (e.g., letter from Senator Larry Craig to Ed Bangs 1993 [USFWS, 1994]; Group Solutions, 2016) and target certain conservation reliance elements (e.g., assisted migration, cost, captive breeding, in-field veterinary care) to oppose carnivore conservation. Additionally, intense and divisive normative debates persist about the degree to which humans should intervene in evolutionary processes such

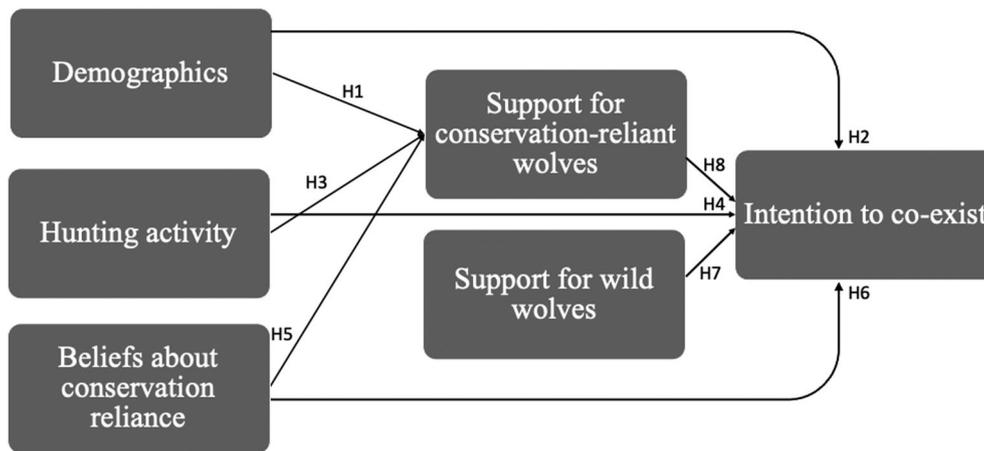


FIGURE 1 Theoretical model

as the spread of alien species (Mulcock & Trigger, 2008) and may be measured with items that capture a “Mother Nature knows best” sentiment (e.g., Serenari & Taub, 2019). The fifth and sixth hypotheses assert that beliefs will influence support for conservation-reliant wolves (H5) and intention to coexist (H6).

A causal relationship between support for conservation-reliant wolves and intention to share space with wolves may exist. Research suggests there will be a negative relationship between support for wild wolves and intention to coexist because the closer human settlements are to wolves the less tolerant humans tend to be, and negative attitudes emerge (Mech, 2017, p. 312) (H7). Relatedly, wolves’ perceived right to exist may erode (von Essen & Allen, 2020). However, the literature insufficiently explores these relationships. However, previous research suggests that perceptions of nature- (e.g., naturally dispersed) versus human-powered wildlife (e.g., introduced by humans) can be culturally divisive or unpalatable among some segments of the public (Peterson et al., 2020; Serenari et al., 2018). Further, as policy tools are an amalgamation of design and ideology, the final hypothesis joins the aforementioned notion with Scott et al. (2005) and Goble et al. (2012)’s declaration that conservation reliance comprises concentrated human activities to propagate declining species. We posit that support for conservation-reliant wolves (and, thereby, engaging in associated activities) will influence intention to coexist with wild wolves (H8).

A review of the carnivore, tactical policy (i.e., management strategies), and coexistence literature produced an *intention to coexist* variable. Research suggests that tactical policy is closely tied to an individual’s tolerance or intention to share space with carnivores. Tolerance, a widely studied phenomenon that has been enfolded into the coexistence construct (Expósito-Granados et al., 2019), is defined here as one’s cognitive and material capacity to endure continued subjection to

carnivores. Treves and Naughton-Treves et al. (2005) argued that lethal control must raise tolerance for damage without detrimental population reductions. Morzillo and Needham (2015) demonstrated links between tolerance, carnivore impacts, and management strategies (i.e., tactical policy), demonstrating that impacts are tolerable to a degree, but as tolerance waned, more aggressive policies were supported. Likewise, Inskip et al. (2014) revealed that individuals with lower tolerance of tigers were more likely to favor lethal control. They concluded by arguing that increased tolerance will help increase support for carnivore conservation and likelihood of long-term coexistence (echoed by Frank, 2016 and others). In this view, building tolerance can be considered not just a psychological construct (Slagle & Bruskotter, 2019) or necessary condition (Expósito-Granados et al., 2019), but as tactical policy to achieve coexistence along with translocation, trapping, and lethal control. Hence, it is included as one of four tactical policies considered within the intention to coexist variable.

2 | METHODS

2.1 | Study area

Red wolf recovery was humans’ first attempt to release an apex predator back into the wild after being declared extinct in the wild. Red wolves were first listed as endangered by the U.S. government in 1967. Official recovery efforts began with the passage of the ESA of 1973, and culminating with releases on the mainland of North Carolina in September in 1987 (Phillips & Parker, 1988). The population peaked at 130–150 individuals in the mid-2000s, but, for several reasons, red wolves are again nearing extinction in the wild.

The red wolf recovery area comprises public and private wetlands, lowland forests, and large agricultural

fields, totaling 6,648 km². Formerly known as the Red Wolf Recovery Zone or the Red Wolf Non-Essential Experimental Population Area, it has historically comprised of five counties (Beaufort, Dare, Hyde, Tyrrell, and Washington) on North Carolina's Albemarle Peninsula (AP). The region is lauded for its biological diversity, but is often described as some of the most rural, remote, and economically marginalized territory in North Carolina. A strong hunting culture exists in the recovery area, where hunt clubs and hunting leases are said to be an important part of the local economy, a condition that has contributed to enduring social conflict over recovery (Serenari et al., 2018).

2.2 | Sampling and survey administration

A larger study of landowners conducted by the North Carolina Wildlife Resources Commission (NCWRC) provided data for the analysis. The unit of analysis was selected from a random sample of Beaufort, Dare, Tyrrell, Hyde, and Washington County residents, age 18 years of age and older, who made land use decisions for the household. The original research team (including the author) used a multi-modal contact approach (telephone [landline and cellphone], email, postal mail) to ensure complete coverage of the population at a 90% confidence level (Dillman et al., 2014). Additional methodology specifics can be found in Responsive Management's report (2017).

2.3 | Operationalizing the model

Inspired by Ratamäki (2008), most statements were contextualized (Table 1). This study employs data from seven survey items used by Serenari and Taub (2019) to study policy legitimacy. For this study, we addressed missing data using Markov Chain Monte Carlo (MCMC) and items assigned to beliefs, intention to coexist, and support variables.

Baseline support for wild and conservation-reliant wolves. We used a scale of 1–5 for both constructs, where 1—strongly oppose and 5—strongly support, and including a do not know option. We captured baseline support for wild wolves asking, *Do you oppose or support having wild red wolves on the AP?* Employing the normative definition of conservation reliance by the USFWS and other entities invoking the phrase “continued intensive management,” we asked respondents to indicate their level of support for conservation-reliant wolves by expressing their support for wild wolves under the following condition—*The USFWS cannot maintain a viable*

TABLE 1 Mean and standard error of items used in analysis

	Mean (SE)
Beliefs^a (IV)	
<i>Red wolves are a species worthy of protection under the endangered species act</i>	3.37 (.060)
<i>I accept that biologists euthanize red wolf-coyote pups to help the red wolf survive on the AP</i>	2.91 (.052)
<i>I support captive breeding to help the red wolf exist in the wild</i>	2.83 (.055)
<i>Money is not overspent on red wolf recovery on the AP</i>	2.49 (.052)
<i>I trust the USFWS biologists to manage red wolf impacts</i>	3.17 (.059)
<i>The USFWS should not let nature take its course with the red wolf</i>	2.51 (.060)
Intention to coexist^b (DV)	
<i>If red wolves are using private land, tolerating red wolves would be...</i>	2.75 (.064)
<i>Allowing a USFWS biologist to gradually remove them over time</i>	3.53 (.061)
<i>Not allowing a USFWS biologist to trap and move them</i>	2.23 (.060)
<i>Not allowing a USFWS biologist to shoot and kill them</i>	3.00 (.067)
Level of support^c	
<i>The USFWS cannot maintain a viable population of red wolves without continued intensive management (i.e., support for conservation-reliant wolves) (IV)</i>	2.61 (.060)
<i>Having wild red wolves on the AP (IV)</i>	2.75 (.063)
<i>The Endangered Species Act (IV)</i>	3.60 (.078)

Note: Likert scale 1–5:

^astrongly disagree–strongly agree.

^bunacceptable or acceptable.

^cStrongly oppose—strongly support.

population of red wolves without continued intensive management (i.e., The USFWS needs to employ hands-on management to keep wolves on the ground [1 = oppose conservation reliance]).

Beliefs about conservation reliance. Because ideology is an integral part of why conservation reliance exists, six statements attempted to capture normative preferences for red wolf recovery under this condition, including operational aspects of conservation reliance. Response options employed a 1 = strongly disagree to 5 = strongly agree with a do not know option (* = reverse coded for analysis): *Red wolves are a species worthy of protection under the Endangered Species Act; I accept that biologists*

*ethanize red wolf-coyote pups to help the red wolf survive on the AP; I support captive breeding to help the red wolf exist in the wild**; *Money is not overspent on red wolf recovery on the AP**; *I trust the USFWS biologists to manage red wolf impacts*; and *The USFWS should not let Nature take its course with the red wolf**. The six statements were aggregated to create a mean composite variable called conservation-reliant beliefs. A higher mean indicated that a conservation-reliant designation was an acceptable policy tool to respondents. A Cronbach's alpha test indicated an acceptable reliability score (.697, Table S1), but we note that this score is arguably not meaningful at this experimental stage as each item was not originally intended to hang together. Therefore, items performing below standard reliability thresholds were not deleted for heuristic purposes.

Intention to coexist. Four statements comprised a summed multi-item variable referred to as intention to coexist. Respondents indicated their level of acceptance on a scale of 1–5, where 1 = unacceptable and 5 = acceptable with a do not know option. Following previous research, statements represented a gradient of space sharing with wild wolves to better gauge intention to act across the range of management options (Morzillo & Needham, 2015). We fortified respondents' intention to share space by also accounting for rejection and agreement with more aggressive technical policies that removed wolves from the landscape gradually or instantaneously. Tolerating wolves anchored one end, which suggests living peaceably (Treves et al., 2013), and support for lethal control denoted the highest degree of intolerance (* = reverse coded for analysis): *Tolerating red wolves*; *Allowing a USFWS biologist to gradually remove them over time*; *Not allowing a USFWS biologist to trap and move them far away**; *Not allowing a USFWS biologist to shoot and kill them**. After recoding, a higher score revealed an elevated intention to share space. The maximum score was 20, and the minimum was 4.

Hunting activity was determined by asking, *If you hunt, what game do you pursue most?* and then creating a dummy variable to denote behavior (1 = non hunter, 2 = hunter). Demographic and lifestyle questions to be considered included gender (male/female), age, race, income range, and highest level of education achieved, and a background question measuring support for the Endangered Species Act.

2.4 | Analysis

Due to split-sample survey administration, missing-at-random data for the variables of interest ranged from 2 to 62%, mainly impacting the beliefs construct (42–62%).

Though the data retained moderate statistical power, for heuristic purposes and to achieve more conservative estimates, we conducted multiple imputation employing MCMC with a linear regression approach to represent missing-data uncertainty. The importance of the beliefs items were deemed too important and instructive to delete records. Imputation procedures employed 40 imputations (Graham et al., 2007) and followed a normative guideline of 10 iterations.

We tested for direct effect of baseline support for wild wolves, support for conservation-reliant wild red wolves, hunting activity, demographics, and beliefs underpinning conservation reliance on intention to coexist (DV). We also measured the influence of demographics, beliefs, and hunting activity on support for conservation-reliant wolves (DV). Each analysis entailed a simultaneous entry multiple linear regression model. We retained only statistically significant interactions. We did not pursue path analysis because one rule of path analysis is that variables must have a clear time-ordering because one variable cannot be said to cause another unless it precedes it in time (e.g., pretest/test; cognitive hierarchy). Because baseline support for wolves and support for conservation-reliant wolves can co-occur, a clear temporal path was not evident or logical at this stage of investigation. This may have been evident by unacceptable goodness of fit scores, which led to choosing a two-regression-model approach.

All predictor variables fell within the acceptable coefficients of tolerance (.1) and variance inflation factor (VIF = 10) (Pallant, 2020). Statistical tests were performed with IBM SPSS Statistics 25 (IBM Corp., Armonk, NY). We set statistical significance for all tests at alpha (α) = .05. Original data collection by the NCWRC via Responsive Management followed human subject research protocols established by North Carolina State University, and we obtained informed consent from all individual participants included in the study through their agreement to participate.

3 | RESULTS

3.1 | Sample characteristics

The response rate for the overall study was 17%. We extracted usable responses from a sample of 639 valid responses to the conservation reliance question. The sample averaged 62 years of age and 80% self-reported as Caucasian. Most of the sample owned land in the recovery area (94%) for an average of 23 years. Respondents achieved at least a high school degree (95%), were primarily male (57%), and earned a household income of at

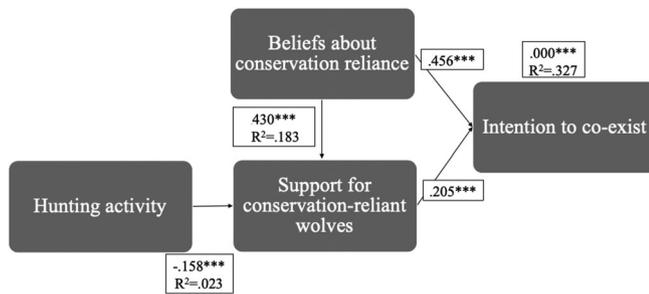


FIGURE 2 Parsimonious model focusing on influence of conservation-reliant wolves

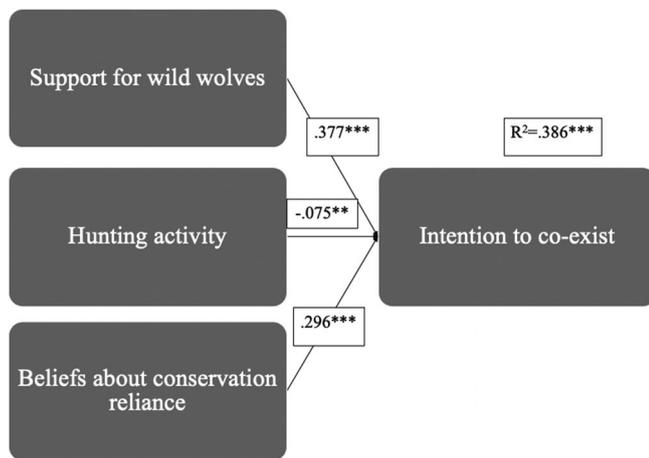


FIGURE 3 Parsimonious model focusing on influence of baseline support for wild wolves

least \$40,000 (78%). Respondents supported the ESA (59%, $\bar{X}[SE] = 3.66[.081]$) but tended not to support red wolf recovery on the AP (45%, $\bar{X}[SE] = 2.75[.063]$), and opposed the idea of a conservation-reliant red wolf (48.5%, $\bar{X}[SE] = 2.61[.060]$) (Table 1).

3.2 | Model results

Results from our first model revealed that demographics did not influence either outcome variable, refuting H1 and H2. Hunting activity was a predictor of support for conservation-reliant wolves ($\beta = -.158$, $p < .001$) and intention to coexist ($\beta = -.075$, $p < .01$), supporting H3 and H4 (Figures 2 and 3).

Beliefs underpinning conservation reliance influenced an increase in intention to coexist with wolves ($\beta = .456$, $p < .001$, Figure 2) supporting H6, followed by support for conservation-reliant wolves (and, thereby, engaging in associated activities) ($\beta = .205$, $p < .001$), supporting H8. Support for wild wolves explained the most variability in the response ($\beta = .377$, $p < .001$, Figure 3),

followed by beliefs underpinning conservation-reliant wolves ($\beta = .296$, $p < .001$). Findings support H5 and refute H7.

4 | DISCUSSION

A substantial number of landowners on the AP may reject a critical means to maintain and protect the red wolf more so than they support it. Findings support the idea that respondents, particularly hunters, oppose the notions of conservation-reliant wolves and intentions to coexist (peaceably share space) with them. Because hunters have been partially blamed for the latest demise of the red wolf in the wild (Hinton et al., 2017), it is possible that a segment of respondents were aware that human intervention is the key piece to red wolf recovery as well as their extinction. Taken together with results on respondents' disinclination to support red wolf recovery, it is also plausible that unsupportive respondents believed decoupling red wolves from human intervention will make the problem of a maligned 30-year recovery project disappear. As evidenced by debates concerning climate change (hegemonic neoenvironmental determinism [Morgan, 2013]) and rewilding (ecological experimentation and manipulation [Pettorelli et al., 2018]), opposing human intervention in the natural world is a viable tactic for coalitions seeking particular policy outcomes, but risks trading off intellectual honesty for relativism.

Respondents appear to also have divergent dispositions towards accepting or rejecting particular forms of endangered species and, therefore, understandings of what wildlife belongs and its value (Trigger et al., 2008). The models revealed that respondents who agreed with the theoretical ideological underpinnings of intensively managed wolves supported a conservation-reliant approach. Similarly, less supportive respondents' interpretation of recovery based on deliberate policy promoting intensive or hands-on management to propagate wolves could be construed as “faking nature” (Elliot, 1982). Fake things are often assigned less value in society. Elliot's (1982) charge that restoring nature is parallel to producing a forgery provides two implications for red wolf recovery. First, though the modern version of the red wolf still howls, mates, and eats deer, its genesis has been a point of contention. After capturing the remaining wild red wolves, the USFWS used morphological standards to commence captive breeding (Hinton et al., 2013), an approach derided by critics. Abridging criticism, red wolf recovery has been “spoiled by the facts of origin,” labeled a forgery, and assigned a diminished value (Elliot, 1982, p.384). Because culturally driven assumptions and judgements yield an “imaginative

geography” (Philo & Wilbert, 2000) of wolves, partly in terms of its spatial origins, no level of understanding of and appreciation for the red wolf’s aesthetic or ecological utility will be bolstered through everyday governance instruments designed to persuade people to think differently on the AP. Second, for generations, citizens’ relations with nature on the AP has been associated with a wolfless landscape. Hence, red wolf recovery has few qualities that render it holistically essential (Elliot, 1982) to critics, a social fact to which the ESA and its mandate to recover the wolf to its historical range is blind. In sum, instrument preference and utility must align with material and symbolic aspects of a place-based culture and not force citizens to give up cultural imperatives (Hettinger, 2012). For respondents’ who disapprove of a hands-on philosophy and approach, it is better to have no wolf than a fake one that devalues existing human-nature relations on the AP.

Recovery projects attached to a conservation reliance designation may, in some instances, actually erode the value of the species these projects intend to preserve. This notion is paradoxical given that human intervention is a requisite of wildlife management (Peterson et al., 2020). Ethical and cultural dilemmas underpin opposition to wild, human-dependent red wolves that cannot be swept aside by merely embracing vanguard instruments intended to elevate the value of species, such as payments to encourage coexistence (Dickman et al., 2011; Pettigrew et al., 2012; Treves et al., 2009), wildlife tourism development (Ashley & Roe, 1998), authoritative devices such as species-specific legislation/listing (e.g., Collen et al., 2013; Trouwborst, 2010), and scientific management (Clark & Rutherford, 2014). The carnivore governance paradigm carries an inherent dependence on the same suite of instruments to either persuade or mandate that important advocacy coalitions, like hunters, coexist with carnivores. However, this study suggests that a conservation reliance designation may negate any positive gain from other instruments used and highlights a need to thoughtfully design and contextualize policy instruments (Hall et al., 2012), including those that may appear to be just words on paper. Conservation reliance is more than a term or cog in the wheel of carnivore governance because it is predicated on individual and collective views of the merits of restoration and, as evidenced here, crucial to local level support for recovery. Language shapes human-carnivore conflict and conservation outcomes (Peterson et al., 2010; Rodewald, 2016; Serenari & Lute, 2020), and future investigations will want to scrutinize how other key designations, such as “nonessential,” “experimental,” or “nuisance” influence the value of carnivore recovery and conservation among coalitions. These assertions

should be further examined by research that examines the role of conservation reliance in regards to other species, including those that are less controversial.

This study’s results extend into ongoing debates on preventing extinction of biodiversity through anthropogenic versus natural systems in the following ways. First, as conservation reliance becomes increasingly normative, managers will need to change the tools of the game because the game is changing. Over half of the Earth has been transformed by humans (Keller & Day Jr., 2007), and though species-specific legislation has likely saved thousands of species from extinction (e.g., Salzman & Thompson, 2010), an overwhelming percentage of taxa are conservation-reliant already. Those percentages are growing. In the case of the ESA, 84% of the species listed are conservation-reliant (Scott et al., 2010). Invoking governance instruments unprepared to handle these trends can lead managers on a March of the Folly (pursuit of policy that is, in this case, contrary to the interests of society, Tuchman, 2011) and straight toward a “fracture zone in conservation” concerning human intervention in natural processes (Adams, 2017, p. 7). We have entered a distinct moment in human history where societies are reconsidering the future of their landscapes. Researchers, policymakers, and managers are being asked to consider the implications of their findings or actions within the larger economic, social, and political contexts and, if possible, forecast the likelihood of achieving self-sustaining levels (Rodewald, 2016). Social disapproval of conservation reliance poses new confronts to restoration politics and its diversity of strands, which must be woven into carnivore policy and management. Analyzing the relevance of design dimensions, such as technical policies, helps assess alignment between social legitimacy and global, national, or state conservation targets (Freitas & von Tunzelmann, 2008).

Second, resistance to conservation reliance of red wolves also highlights a disconnect between the restoration paradigm and recovery involving private lands. Recovery on private lands are problematic in general, but as this study illuminates, the “insidious dream” of human domination and powering of nature (Katz, 1991, p. 90) also dominates the public by hyperfocusing on wilderness while glossing over blighted landscapes involving private lands. Extrapolating the results of this study yields at least eight normative arguments that confront the existing paradigm’s assumptions and principles on the AP: (a) not all human degradation requires restoration; (b) preserving wolves will not enhance the existing AP mosaic; (c) wolf restoration does not make sense given the current state of human activity on the AP; (d) spending vast resources to restore one species is likewise bewildering; (e) the humanity that degraded wolf

populations generations ago is not relevant today; (f) wolves' true social value is not found in the biodiversity of bygone ecosystems; (g) preventing future damage by humans makes more sense than repairing damage (Elliot, 1982); and (h) humans do not need to be reinserted into nature because they are already a part of it. A question in need of urgent answers is how to reinvent the definition of recovery policy success given this divergence from the existing paradigm.

Unfettered human activity will result in tradeoffs that dictate which species will live and which will go extinct. These hard choices have consequences for social and biotic life and their relational ties. These choices do not get easier with increasing numbers of conservation-reliant species. To best represent society's evolving objectives and overcome the challenges to recovery and postrecovery carnivore management, conservation leaders will need to confront the political and ethical realities and tensions of preserving carnivores. Nature is not failing us (Rolston III, 1994), governance designs that do not attend to these critical pieces of the puzzle are failing us, a function of the assemblage of instruments (Ratamäki, 2008) that allegedly represent the best humanity has to offer. Visvader (1996) stated, "We need to understand both the 'natural' and the 'wild' in such a way that we can imagine giving more to the world around us than the gift of our mere absence" (p. 18). If it is society's intent to coexist with as many species as possible, debating the rightful contributions of natural and anthropogenic systems should yield many gifts, including breaking free from hackneyed and troublesome instruments that do not produce coexistence arrangements at the landscape scale. But first, we must interrogate what policy instruments, such as a conservation reliance designation, do in practice (Bressers & O'Toole, 2005). This understanding can reveal how an unpredictable public negotiates them and, as a result, assigns meaning to the conservation project in question, as well as what effective wildlife conservation governance might look like and requires.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

AUTHOR CONTRIBUTION

The author designed the survey and conducted data analysis. The author conceived and wrote the manuscript.

ETHICS STATEMENT

The research team followed human subject research protocols established by North Carolina State University, and obtained informed consent from all individual participants included in the study through their agreement to participate.

DATA ACCESSIBILITY STATEMENT

The data is available upon reasonable request.

ORCID

Christopher Serenari  <https://orcid.org/0000-0001-9554-7479>

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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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