15 June 2020

I appreciate the opportunity to comment on the following action by the U.S. Fish and Wildlife Service (USFWS):

DEPARTMENT OF THE INTERIOR, Fish and Wildlife Service, 50 CFR Part 17
[Docket No. FWS–R2–ES–2020–0007; FXES111302WOLF0-201-FF02ENEH00] RIN 1018–BE52

Endangered and Threatened Wildlife and Plants; Revision to the Nonessential Experimental Population of the Mexican Wolf (Canis lupus baileyi); Environmental Impact Statement
AGENCY: Fish and Wildlife Service, Interior. ACTION: Notice of intent to prepare a supplement to an environmental impact statement. (EIS)

My comments offer relevant science-based information for determining the scope of the proposed rule revision and draft supplement to the EIS.

I am a professor of environmental studies at University of Wisconsin-Madison and direct the Carnivore Coexistence Lab. I have been studying predator-prey ecology for 30 years. I have published 84 peer-reviewed scientific journal articles on ecology, conservation, and predator management plus another 49 book chapters and technical articles on these topics. I have served as a peer reviewer for the USFWS proposed rule delisting gray wolves nationwide in 2019. I led or co-authored 2 scientific papers analyzing data on Mexican wolves.

The evidence I present contradicts poorly supported claims that relaxing Endangered Species Act (ESA) protections will raise tolerance for wolves or reduce poaching of wolves. Indeed, I present scientific evidence that directly undermines the notion that loosening ESA protections helps protect endangered wolf populations.

Instead, the evidence I present supports the commonsense approach that protecting endangered species requires enforcement and strengthening protections against those who would kill wolves. I present scientific evidence from peer-reviewed studies showing that attempts to weaken ESA protections result in intolerance and illegal killing of the endangered species.

Poaching is difficult to measure, especially when evidence is destroyed by perpetrators (cryptic poaching), but recent advances have shed considerable light on these issues.

1. **Intolerance for wolves is believed to cause intentions to poach**: Inclinations to poach and intolerance for wolves averaged higher among Euro-Americans compared to Ojibwe, averaged higher among males compared to females, averaged higher among bear-hunters and carnivore-hunters compared to other hunters, and averaged higher among livestock owners compared to their county neighbors who did not own livestock [1-4]. Tolerance for wild predators seems more closely linked to social identity and policy than to economic costs of predators or individual experiences with predators [2, 5-9]. Hunters and especially hunters of carnivores show higher inclinations to poach wolves despite endangered species status [5, 6, 10]. Opportunity to poach rose during the deer-hunting seasons [11].
2. **Policies that made it easier to kill wolves were followed repeatedly by declines in tolerance for wolves and increases in the inclinations to poach wolves:** Inclination to poach rose after the initiation of policies for liberalizing wolf-killing in Wisconsin from 2003–2012 (We define

liberalizing wolf-killing as policies that issue permits for wolf-killing despite endangered status or down-listing to threatened or unprotected status) [2, 3]. Intolerance for wolves rose after liberalizing wolf-killing in Wisconsin in 3 studies measuring attitude change after 3 different policy changes to liberalize wolf-killing from 2003–2013 [2-4]. Intolerance rose specifically among male, non-tribal residents of Wisconsin's wolf range after public hunting, trapping, and hounding were initiated [4].

3. **Recommendations from points 1 and 2 above. R**egulators should enforce protections particularly strictly during hunting seasons and reduce the opportunity for hunters to confuse coyotes with wolves [12, 13]. I predict that catering to the demands of hunters or livestock owners by liberalizing wolf-killing is an invitation to them and their associates to poach Mexican wolves.
4. **Individual wolf survival rates decreased during periods with liberalized wolf-killing independent of legal, lethal management**: Policies for liberalizing wolf-killing were followed by increases in disappearances of radio-collared wolves in Wisconsin 1979-2012 [14]. A slight decrease in observed poaching was overwhelmed by a major increase in disappearances of radio-collared wolves during 6 episodes of liberalizing wolf-killing when ESA protections were relaxed. This analysis invalidates a prior effort at answering the same question [15], which did not use time-to-event analyses, only analyzed observed poaching, among other shortcomings.
5. **Population-level models from Wisconsin and Michigan show slow-downs in the growth of wolf populations when wolf-killing was liberalized:** Policies for liberalizing wolf-killing were followed by slow-downs in population growth of the gray wolves of Michigan and Wisconsin independent of the effects of legal, lethal control [16-19]. There is a misconception that the latter findings were weakened by scientific debate arising from brief letters [20-22]. Chapron & Treves [17, 18, 19) rebutted all claims and found misunderstandings or errors in the critiques. Moreover, the findings of Chapron & Treves' population models {Chapron, 2016 #2077] have been strengthened by the lines of evidence in points above.
6. **Cryptic poaching can be severe and has traditionally been under-estimated:** In Wisconsin, poaching is the major cause of mortality and half of it is estimated to be cryptic [23]. Previous models of Wisconsin wolf mortality omitted a crucial change of methods for wolf census, so I do not discuss them here; interested readers are directed to [24, 25]. The rate and risk of poaching in two populations of gray wolves, in Mexican gray wolves, and in red wolves have been under-estimated by omission of wolves that disappeared (lost to monitoring) [14, 26].
7. **Scandinavia provides no support for the notion that liberalizing wolf-killing will reduce poaching:** In Sweden and Norway, cryptic poaching was shown to account for two-thirds of poaching and overall 51% of mortality was attributable to the sum of observed and cryptic poaching [27]. In Scandinavian, visual inspection of wolf monitoring data and simple correlational analyses reveal increases in disappearances of marked, breeding wolves after policies liberalizing killing were implemented [28], although [29] concluded the converse using unorthodox models and data depictions that seem to confound analyses. Until re-analysis those conclusions about poaching and legal killing from Scandinavia are uncertain [28].
8. **Lethal control of wolves for domestic animal protection is not supported by strong evidence: T**he claim that one needs to kill Mexican wolves to protect domestic animals is also flawed by a lack of evidence that such killing prevents future losses. Indeed, lethal control has a poor record with several studies showing counter-productive increases in livestock loss after wolf-killing [30-32] also see [33]{Moreira-Arce, 2018 #2416}. The only study that show decreases in livestock loss after wolf-killing among the Northern Rocky Mountain gray wolves [34] has not been revised to address an overwhelming bias in its methods and sampling design, nor has any study undermined the finding that Michigan's lethal control of wolves led to three times higher risk of

increased livestock loss in neighboring townships [35]. Two additional caveats are worth noting. Blaming wolves for livestock loss often ignores the health and condition of the livestock – if they were malingering or injured before wolves appeared, the implication that wolves are responsible for their deaths is misleading [36]. Second, the notion that deregulating or loosening protections for wildlife to allow private citizens to kill a few will help to conserve the populations as a whole contains a logical flaw: it is precisely careful regulation of unregulated killing that helped to protect wildlife in North America and unregulated killing that led to extirpation of so many predators such as Mexican wolves [37].

Finally, I wish to point out that rebuttals that New Mexico and Arizona differ from all other sites mentioned above in features of ecosystems, livestock husbandry, wolf biology, or jurisdictions are true but are also irrelevant or have not been shown to be relevant to the findings above. Another common attempt at rebuttal is to claim studies are retrospective and therefore not predictive. This is spurious because all scientific data analyses are retrospective. Another common claim is that small-scale analyses within fenced pastures do not hold for other conditions – e.g., open-range, unfenced livestock operations -- are erroneous. The reviews by [30-32] include both types of livestock operations. Finally, failure to cite relevant work is not simply an oversight but a breach of scientific integrity widely recognized in the scientific community today as evidence for invidious bias [25, 36, 38-41]. I mention these meta-issues to alert the USFWS to 21st century standards of evidence and scientific integrity [42].

I have shared many of the citations above with USFWS in my 2019 peer review [25] and in previous public comments, in a peer-reviewed article about nationwide wolf delisting [43] and in a letter to the USFWS in my region [44]. I infer from the lack of reciprocal communication from the USFWS and the repeated relaxation of protections by USFWS for gray wolves, Mexican gray wolves, and red wolves that the USFWS either (a) does not communicate between regions., so is unaware of other USFWS region's work on liberalizing wolf-killing, or (b) does not follow the best available science as mandated by the ESA. Either way, I recommend reform of the procedure for reviewing and integrating science into regulatory decisions.

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