June 12, 2020

U.S. Fish and Wildlife Service
Attn: FWS–R2– ES–2020–0007;
5275 Leesburg Pike, MS:PRB/PERMA (JAO/1N)
Falls Church, VA 22041–3803

Re: Comment on Preparation of an Environmental Impact Statement on Revision to the Nonessential Experimental Population of the Mexican Wolf (*Canis lupus baileyi*) (Docket # FWS-R2-ES-2020-0007)

On behalf of the Society for Conservation Biology North America ("SCBNA") and the American Society of Mammalogists ("ASM") we are writing to submit comments regarding the Environmental Impact Statement for the *Revision to the Nonessential Experimental Population of the Mexican Wolf* (hereafter "10(j) rule revision") that was recently opened to scoping by the U.S. Fish and Wildlife Service ("Service"). In our comments, we explain why the 10(j) rule revision must take a fresh look at best available science regarding what steps are necessary for recovery of the Mexican wolf, rather than relying on the 2017 recovery plan (USFWS 2017a), whose deficiencies we describe in detail below.

SCBNA is an independent affiliate of the global Society for Conservation Biology, an international professional organization of over 3,000 members established in 1985 to advance the science and practice of conserving the Earth's biological diversity. ASM was established in 1919 for the purpose of promoting interest in the study of mammals worldwide and has a current membership of 2,500. The ASM has long provided information for public policy, education and resource management, and strongly supports the conservation and responsible use of wild mammals based on current, sound, and accurate scientific knowledge. SCBNA and ASM write to provide information that can help ensure that the 10(j) rule revision is based on best available science and will ensure recovery of this highly-imperiled species.

SCBNA and ASM have a long involvement in the conservation of the Mexican gray wolf (*Canis lupus baileyi*, hereafter 'Mexican wolf'). In 2007, ASM passed a resolution requesting that the Service expedite revision of the Mexican wolf recovery plan to ensure the recovery of populations of Mexican gray wolves, while in the same year, SCBNA submitted comments recommending alternative management approaches for the Mexican wolf, focusing, in particular, on the urgent need for a revised recovery plan. In 2009, the ASM again asked the Department of the Interior to expedite revision of the 1982 recovery plan (USFWS 1982) and to identify additional recovery areas for the Mexican wolf. In 2010, SCB repeated its request to the agency to expedite development of a recovery plan. In 2012, SCBNA, ASM, and the Society for Ecological Restoration, in a joint letter, offered to provide an independent scientific peer review of an unpublished draft recovery plan (USFWS 2012) in order to expedite progress on Mexican wolf conservation. In 2014, SCBNA and the ASM provided joint comments on the previous revised 10(j) rule for the non-essential, experimental population of Mexican wolves in Arizona and New Mexico. And most recently, in 2017, SCBNA and the ASM provided joint comments on the draft of the 2017 Mexican wolf recovery plan (USFWS 2017a).

Context of the current scoping

The Service published revised regulations for the nonessential experimental population of Mexican wolves in 2015 (80 FR Part 2512). The Service's current 10(j) rule revision process stems from a court-ordered remedy resulting from litigation brought by environmental groups challenging the 2015 10(j) rule. In a 2018 ruling, the court concluded that "The [2015] rule as a whole fails to further recovery" and required the Service to remedy "deficiencies" that the court identified in the 2015 10(j) rule (*Center for Biological Diversity v. Jewell*, No. 4:15-cv-00019-JGZ (D. Ariz.); March 31, 2018, henceforth "Order").

In the interim between the 10(j) rule and the court decision, the Service revised the Mexican wolf recovery plan (USFWS 2017a). Based on the scoping notice, we infer that the Service's primary strategy for addressing the court order is to reference the 2017 Mexican Wolf Recovery Plan. For example, the scoping notice states, "To the extent possible, and as described below, we will address the remanded issues by aligning the new revised rule with the revised recovery plan" (FR 85 20969). This approach is highly problematic for reasons that we detail below.

Our 2017 letter reviewing the Draft Recovery Plan noted key shortcomings undermining its effectiveness, including: (1) limiting recovery to those areas of Arizona and New Mexico south of Interstate 40 in Arizona and New Mexico; (2) using a disturbingly high threshold for acceptable extinction risk; (3) absence of objective and measurable recovery criteria at the downlisting and delisting stages to sufficiently address the genetic and other threats facing the Mexican wolf; and (4) proposing to give Arizona and New Mexico's game management agencies—both of which have demonstrated a long track record of opposing Mexican wolf conservation—veto power over releases and translocations that are necessary for long-term viability and maintaining genetic diversity. These shortcomings remained in the final version of the recovery plan (USFWS 2017a).

We concluded in our 2017 review that the Mexican wolf could remain at significant risk of extinction even if the species met the recovery criteria proposed in the recovery plan. Because the Service has proposed in its scoping notice to use the 2017 recovery plan as the foundation for the 10(j) rule revision, this conclusion is relevant to the current 10(j) rule revision as well.

Because the deficiencies of the 2015 10(j) rule were subsequently duplicated in the 2017 recovery plan, we discuss below the major issues that we have identified, as they occur in both documents. These include 1) arbitrarily high thresholds for acceptable extinction risk, 2) lack of objective and measurable recovery criteria regarding threats from illegal killing and other anthropogenic mortality, 3) lack of objective and measurable recovery criteria regarding genetic threats, and 4) arbitrary limits on the geographic extent of recovery.

1. Arbitrarily high thresholds for acceptable extinction risk

The concept of "acceptable extinction risk" was perhaps first considered by Shaffer in his seminal 1981 paper on population viability analysis, in which he proposed what he acknowledged was an inherently arbitrary threshold for species persistence:

> A minimum viable population for any given species in any given habitat is the smallest isolated population having a 99% chance of remaining extant for 1000 years despite the foreseeable effects of demographic, environmental, and genetic stochasticity, and natural catastrophes. I must stress the tentative nature of this definition. The critical level for survival probabilities might be set at 95%, or 100%, or any other level. Similarly, the time frame of 1000 years might be lengthened to 10,000 or shortened to 100 (Shaffer 1981).

In contrast to the thresholds listed above, the 2017 recovery plan states that the Mexican wolf can be considered recovered at population levels at which the species "has approximately a 90% probability of persistence over 100 years." SCBNA and ASM assert that a 10% risk of extinction within 100 years is significant and would not represent a recovered species. We note that the threshold of 90% chance of persistence equates to a risk of extinction that the IUCN red list considers "vulnerable" (IUCN 2012). The 2017 Recovery Plan does not present scientific support nor does it cite literature to support this threshold. In a peer-reviewed survey of recovery plans completed between 1979 to 2012 and covering 1,249 species, Carroll et al. (2019) found only 4 that used an extinction risk as high as 10%. The use of a 10% extinction risk tolerance in the 2017 Recovery Plan is thus anomalous when compared with past recovery plans, and the only example of such use in recovery plans for terrestrial vertebrates.

This issue is relevant to the 10(j) rule revision because the 2017 recovery plan bases the adequacy of its proposed recovery criteria and management actions in large part upon the assertion that such actions will achieve the 90% persistence threshold (an assertion that was itself challenged in subsequent research (Carroll et al. 2019)).

We recommend that the Service adopt an approach such that the management actions described in the 10(j) rule revision ensure a level of extinction risk consistent with the more precautionary thresholds used in other recovery plans.

2. Lack of objective and measurable recovery criteria addressing mortality

Illegal killing and other forms of anthropogenic mortality have had and likely will continue to have a significant negative impact on the Mexican wolf population (Turnbull et al. 2013). Judge Zipps, in a subsequent decision involving a legal challenge to the 2017 recovery plan, identified the plan's lack of objective, measurable criteria to address illegal killing as a violation of the US Endangered Species Act (ESA). The 2012 draft Mexican wolf recovery plan included a detailed criterion regarding anthropogenic mortality, stating that delisting could occur once "[t]he estimated annual rate of human caused losses averaged over an 8-year period is less than 20% as measured by a statistically reliable monitoring effort" (USFWS 2012). In contrast, the 2017 plan opted against creating a quantitative mortality criterion, in deference to resistance by stakeholders to establishing recovery criteria predicated on changes in human behavior. The criteria relevant to mortality adopted in the 2017 recovery plan (USFWS 2017a)

> States and Tribes will ensure regulatory mechanisms are in place to prohibit or regulate human-caused mortality of Mexican wolves in those areas necessary for

> recovery such that the Service determines at least 320 Mexican wolves are likely to be maintained in the United States in the absence of Federal ESA protections.

are vague and fail to meet the ESA's "measurable and objective" standards.

Over a recent 20-year period, 83 deaths of Mexican wolves were classified as illegal; this does not include any of the 21 deaths in 2018 that are still under investigation (Associated Press May 23, 2019). Clearly, human-caused mortality remains a substantial problem that impacts recovery as well as retention of genetic variation in the remaining populations. As stated by Wayne and Hedrick (2011), "Overall, human-caused mortality from illegal killing and road kills, and removals mainly due to human conflict, have severely impacted the ability of this population to increase." While we recognize that lethal control may be necessary in limited circumstances, it remains unclear how this mortality will be minimized and how it will impact retention of genetic variation as well as overall recovery.

We recommend that the Service adopt measurable and objective criteria for anthropogenic mortality and incorporate within the 10(j) rule revision management actions to alleviate this threat and achieve recovery.

3. Lack of objective and measurable recovery criteria addressing genetic threats

Inbreeding depression, the reduced biological fitness that occurs in a population as a result of breeding of related individuals, has been documented as a threat to viability in many small populations (Hedrick 2017). The Mexican wolf population is in dire condition in terms of its genetic health. The level of founder genome equivalents (2.04) is lower than that of any other reintroduced endangered species in North America, except possibly the black-footed ferret (*Mustela nigripes*) (Hedrick 2017). Observed heterozygosity in the captive Mexican wolf population is declining at a rate of 0.6-0.7%/year (Fitak et al. 2017), which underscores the urgent need to represent existing captive genetic diversity in the wild population via releases. Based on a recent genome-wide study of over 170,000 single nucleotide polymorphic loci, more than 50% of all loci were monomorphic across Mexican wolves examined (Fitak et al., 2017). The court found in its decision regarding the 2015 10(j) rule that "By failing to provide for the population's genetic health, FWS has actively imperiled the long-term viability of the species in the wild." (Order at 26:6-8.) The Service acknowledged the severity of genetic threats in its 2017 recovery plan, but again proposed inadequate measures to address the threat (USFWS 2017a).

Recovery plans and PVAs typically aim to institute measures that are effective at retaining at least 90% of the current genetic diversity of a population (Jamieson & Lacy 2012). However, the 2017 recovery plan, rather than basing genetic recovery criteria on the genetic diversity of the original founder population or on existing (i.e., 2017) levels of genetic diversity as a baseline, instead expressed genetic recovery criteria for the wild population in terms of retaining 90% of the depleted genetic diversity that the captive population will hold at some future time. This lower goal allows the 2017 plan to conclude that smaller population caps and numbers of initial releases are adequate to meet a 90% retention goal. Using this shifting baseline as the standard against which recovery is measured is inappropriate, as such a depleted condition

accentuates rather than alleviates genetic threats. The ESA aims not merely to forestall the extinction of a species but to allow a species to recover to the point where it may be delisted.

In addition to using an inappropriately low standard for retention of genetic diversity, the 2017 recovery plan inappropriately interprets PVA results. The plan mistakenly concludes based on PVA results (USFWS 2017b) that genetic threats to the Mexican wolf population will have been addressed once 22 wolves have been released from captivity into the US wild population and survived to breeding age. However, because the pedigree of individuals released into the wild will not closely match the pedigrees of individuals projected to be released in the simulations, the actual genetic contribution of released wolves is unlikely to closely match results simulated in the PVA model used in the 2017 plan.

Recent population growth in the wild Mexican wolf population in the Blue Range is encouraging but does not detract from the ongoing severity of the threat from loss of genetic diversity in the population. Currently, approximately 70% of the wild population receives supplemental (diversionary) feeding during some portion of the year (USFWS 2017b). Because feeding tends to occur for the same packs over multiple years, it may be genetically counterproductive, facilitating the production of highly inbred individuals and accentuating effects of unequal reproductive contribution on effective population size. Such feeding may provide a temporary boost to population growth, but any future termination of intensive feeding measures will expose effects of the population's poor genetic health. For this reason, the 2017 PVA assumes a long-term dependence on supplemental feeding of 15% of the wild population to boost demographic rates in the face of elevated inbreeding and human-caused mortality (USFWS 2017b). The adequacy of the 2017 recovery criteria, which the Service proposes to use as the basis of the revised 10(j) rule, thus implies reliance on long-term feeding, rather than facilitating ecological recovery of populations which do not require such support, a strategy more consistent with the ESA's mandate for recovery of self-sustaining populations.

To meet an appropriate goal of retaining 90% of the total genetic diversity currently represented in the captive and wild population would necessarily involve a large number of initial releases to fully represent the captive population's diversity within the wild population, followed by steps to allow the wild population to grow significantly larger (in both census size and genetically effective population size) than the captive population, which is limited to the 250–300 individuals that can practically be maintained within the zoo network (Carroll et al. 2019). Releases of adult animals would be necessary in addition to the Service's current strategy of exclusive dependence on cross-fostering (placing captive-born pups into wild dens), as a means of introducing genetic diversity from the captive to the wild population (USFWS 2018). Because the cross-fostering strategy has not resulted in sufficient reduction in genetic threats, it needs to be augmented by release of adult pairs.

We recommend that the Service's recovery strategy base criteria for addressing genetic threats on direct assessment of genetic metrics in the wild population over time rather than the total number of releases completed. We also recommend that the Service increase the number of releases (via both cross-fostering and release of adult animals) to a level sufficient to adequately ameliorate genetic threats and retain at least 90% of the current combined genetic diversity of the captive and wild population.

4. Arbitrary limits on the geographic extent of recovery and size of the metapopulation

Due to the problems we have identified with the 2017 recovery plan, the Service's proposed strategy of basing the 10(j) rule revision on the plan would lead to a 10(j) rule with two fundamental errors. The Service would underestimate the number of captive individuals that need to be released into the existing wild population (as described above) and would also underestimate the population size needed for recovery and amelioration of genetic threats.

Given the highly asymmetric breeding structure of wolves, the effective population size is considerably smaller than the overall number of individuals in the population (Hedrick 2017). The 2015 10(j) incorporated a population cap (a threshold which the Service would attempt to keep the population from exceeding) of 325 animals. However, the court concluded that "The population cap of 325 wolves on the size of the US population of Mexican gray wolves does not further the conservation of the species and must be eliminated or increased" (Order at 27:2-4, 25-27; 28:17-18).

The 2017 recovery plan, however, retains this population goal for the US population, stating that a "population average over an 8-year period is greater than or equal to 320 wolves" would be sufficient for delisting. Although the plan aims to establish an additional population in Mexico, effective dispersal across the international boundary would be rare or absent given barriers such as the border wall, and US and Mexico populations would not constitute a metapopulation. The population target of 320 wolves is inconsistent with scientific recommendations established by previous Mexican wolf recovery team science panels, which concluded that three subpopulations totaling 750 individuals constituted an appropriate goal for the Mexican wolf to be considered recovered (USFWS 2012).

Adoption of an excessively low population goal in turn allows the Service to forego the necessary steps to establish new populations in unoccupied suitable habitat in order to establish a viable metapopulation. The court concluded "FWS acknowledges the need for establishing a metapopulation (several semi-distinct populations spanning a significant portion of its historic range) but fails to provide for this need in the 2015 10 (j) rule." (Order at 21:20-24; 24:20-22; 27:2-4; 32:5-8). This problem persists in the Service's strategy for the 10(j) rule revision. In the supplement to the formal scoping notice, the Service states that the "geographic boundaries of the experimental population will not be altered by this action." This statement is clearly inconsistent with the conclusion of the court that "The current [2015] rule fails to provide sufficient geographic range south of Interstate 40 to facilitate recovery of Mexican wolves requiring the elimination or revision of the northern MWEPA boundary." (Order at 27: 8-9; 25-27; 28: Footnote 13; 34: 5-7.)

There is no scientific support for the decision to limit recovery to an arbitrary geographic area bounded by a highway. As SCBNA and ASM have previously noted in joint comments submitted to the FWS in 2014 and 2017, genetic analysis of historic Mexican wolf specimens showed that the range of the subspecies likely extended beyond the initial range that was assumed by earlier scientists (Leonard et al. 2005). Other research has identified areas well to the north of the current distribution as essential to the subspecies (Carroll et al. 2014). In earlier,

unpublished drafts of this recovery plan, the science team commissioned by the Service identified extensive suitable habitat north of Interstate 40 that could support a large population of wolves. No explanation has been included as to why these scientific recommendations have not been considered. Rather, in notes from the recovery planning process, the Interstate 40 boundary was justified for "geopolitical reasons" (USFWS 2016).

Allowing the Mexican wolf to recover in additional places north of Interstate 40 (e.g., the north rim of the Grand Canyon, the San Juan Mountains, and southern Utah) would provide greater representation to ensure the recovery of the Mexican wolf in a variety of ecosystems across the likely historic range that was formerly occupied by either Mexican wolves or closely related, but now extirpated gray wolves. This broader geographic view of recovery is supported by scientific literature and aligns well with the larger purpose of the Endangered Species Act to protect the ecosystems upon which endangered species depend (Carroll et al. 2006).

Underestimation of historic distributions can limit the success of recovery programs, thereby prolonging risk to species as well as increasing the financial cost of recovery efforts (Hendricks et al. 2017). Due to alteration of the historic habitats of Mexican wolves resulting from human development and resource use, the 2012 Science and Planning Subgroup concluded that successful recovery was unlikely if the recovery area for the Mexican wolf focused solely on narrowly-delimited historic range (USFWS 2012).

The 2017 Recovery Plan limits recovery efforts to the areas to the south of Interstate 40 based on a description of the species' historic range derived from limited morphological analyses (Heffelfinger et al. 2017). This perspective is not consistent with more recent molecular genetic analyses of Mexican wolf specimens, which suggest a broader historic distribution of Mexican wolves (Hendricks et al. 2016, 2017, Hedrick 2017). Introgression occurs in numerous mammalian species, including canids, and is an important evolutionary process (vonHoldt et al. 2016a, b). Recent genomic analyses of canids demonstrate genetic exchange due to probable dispersal across the ranges of several subspecies of wolves in North America (Hendricks et al. 2016; vonHoldt et al. 2016 a,b).

We recommend that the forthcoming 10(j) rule revision consider expanding the recovery area northward to productive and diverse habitats such as the Grand Canyon and Southern Rocky Mountains as a means of facilitating recovery of Mexican wolves.

Conclusion

Based on our review of available scientific data, we conclude that a 10(j) rule revision based on the conclusions in the 2017 recovery plan would fail to meet the mandate of the Endangered Species Act, as well as the court's instructions regarding 10(j) rule revision. Although increasing societal support for Mexican wolf recovery through coexistence efforts and collaboration is a worthy goal, the ESA states clearly that certain decisions must be made "solely on the basis of the best scientific and commercial data available." As the courts stated in reviewing the recovery plan for Northern Rocky Mountain wolves, "[e]ven if the Service's solution is pragmatic, or even practical, it is at its heart a political solution that does not comply with the ESA" (Defenders of Wildlife v. Salazar, 729 F.Supp.2d 1207; 2010).

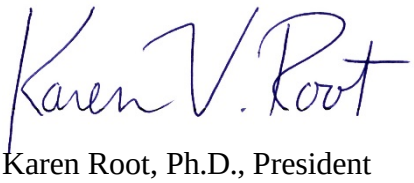
As Judge Zipps clearly stated in her 2019 decision in the recovery plan lawsuit, the Service cannot meet the "best available science" standard required for the 10(j) rule revision simply by referencing the recovery plan:

> Whatever the force of a recovery plan under the ESA, the 10(j) rule must 'further the conservation of [the] species' and release of an experimental population must be determined using the best scientific and commercial data available…As previously stated by this Court, 'the substance or terms of future recovery actions, do not relieve FWS of its obligations under Section 10(j).' (*Center for Biological Diversity v. Zinke*, CV-15-00019-TUC-JGZ (D. Ariz. Mar. 29, 2019))

This concern is amplified by concerns (expressed in a peer-reviewed study (Carroll et al. 2019) as well as the media (Carswell 2017)) that the 2017 Recovery Plan may have been influenced by political needs over scientific insight, resulting in post-hoc justification for aspects of the 2015 10(j) rule that were later found deficient by the court. It would be circular reasoning for the Service now to return before the court and use these 2017 recovery criteria as justification for retaining the problematic aspects of the previous 10(j) rule.

Thank you for your consideration of our comments on this important issue. We offer these comments in a spirit of collaboration and shared interest in the successful recovery of the Mexican wolf. If you have any questions, please do not hesitate to contact us.

Sincerely,



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