

August 24, 2017

Re. Document Number: FWS-R2-ES-2017-0036.

To: United States Fish and Wildlife Service

The Rewilding Institute and Project Coyote appreciate the opportunity to comment on the *Draft Mexican Wolf Recovery Plan, First Revision*. We have a long history of involvement and support for recovery of the critically endangered Mexican gray wolf (*Canis lupus baileyi*). The primary author of these comments is a professional wildlife biologist who was employed by the U.S. Fish and Wildlife Service for 24 years (1975-1999). He served as the USFWS's first Mexican Wolf Recovery Coordinator from 1990-1999.

The *Draft Mexican Wolf Recovery Plan, First Revision* is flawed in so many ways that we conclude it is more likely to cause the second extinction of Mexican gray wolves in the wild than to secure their recovery.

1. The process for developing the recovery plan represents “tyranny by a minority.”

In 2010 the US Fish and Wildlife Service (USFWS) appointed an official Mexican Wolf Recovery Team (2010 MWRT) comprised of multiple stakeholders and a Science and Planning Subgroup (SPS) made up of highly credentialed independent scientific experts who were not employees of the USFWS or the southwestern states where recovery of the Mexican wolf could potentially occur. It should be noted that in 2011, under pressure from the Arizona Game and Fish Department (AGFD), the USFWS acquiesced to allowing AGFD ungulate biologist, Jim Hefflefinger, to join the SPS. From that point forward Mr. Hefflefinger became the sole dissenting opinion for all subsequent recommendations of the 9-member SPS until his resignation from the SPS on December 10, 2012.

The SPS diligently carried out their responsibility to apply the best available science to the objective of developing specific criteria for downlisting the Mexican gray wolf from its classification of “endangered” to “threatened” under the Endangered Species Act (ESA) and “delisting” the Mexican gray wolf from the official list of threatened and endangered species maintained by the USFWS as mandated by the ESA. The SPS produced a 149-page *Draft Mexican Wolf Revised Recovery Plan* on May 7, 2012, which was marked “FOR TEAM USE ONLY NOT FOR DISTRIBUTION.” We understand that a subsequent draft recovery plan comprising approximately 250 pages (plan plus supplementary analyses) may have been submitted to the USFWS by the SPS sometime in 2013.

As late as March 29, 2013, the SPS presented the following criteria to the Director of USFWS:

PROPOSED RECOVERY CRITERIA FOR THE MEXICAN WOLF

DELISTING CRITERIA

Criterion 1 – Population size and trend

Option 1: A metapopulation consisting of a minimum of 3 primary core populations in the wild, each with a census population size of at least 250 individuals, and a total metapopulation size of at least 750 individuals. The population trend in each of the 3 primary core populations has a high probability (80% confidence) of being stable or increasing over 8 years, based on a statistically reliable monitoring effort.

Option 2: A metapopulation consisting of a minimum of 3 primary core populations in the wild, each with a census population size of at least 200 individuals, and a total metapopulation size of at least 750 individuals. The population trend in each of the 3 primary core populations has a high probability (80% confidence) of being stable or increasing over 8 years, based on a statistically reliable monitoring effort.

Option 3: A metapopulation consisting of a minimum of 3 primary core populations in the wild, each with a census population size of at least 200 individuals, and a total metapopulation size of at least 750 individuals. In addition, at least 1 secondary core population consisting of at least 100 individuals, for a total of at least 850 wolves in the wild. The population trend for each of the 3 primary core populations has a high probability (80% confidence) of being stable or increasing over 8 years, based on a statistically reliable monitoring effort.

Criterion 2 –Population connectivity:

Immigration into each of the 3 primary core populations via natural dispersal at a rate of at least 1 genetically effective migrant every generation, averaged over a period of 8 successive years, as measured by a statistically reliable monitoring effort. A genetically effective migrant is defined as a wolf that breeds in a non-natal population and produces at least 1 pup that survives to at least December 31 of the year of its birth.

Criterion 3 – Amelioration of human-caused losses:

The 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. [Text for recovery justification discussion in plan: This is the greatest rate of anthropogenic mortality and removal that a Mexican wolf population could have and still be expected to have an approximately 75% or greater chance of being stable or increasing.]

Criterion 4 – Post-delisting monitoring:

To monitor the continued stability of the recovered Mexican wolf, a post-delisting monitoring plan has been developed and is ready for implementation within the affected states as required in section 4(g)(1) of the ESA.

Criterion 5 - Regulatory mechanisms: State management plans and adequate post-delisting regulatory protection and capacity confirmed. Components of an adequate plan will include assurances that: (1) the natural dispersal rate required for delisting is not precluded by HCL; and, (2) management targets for population size are sufficiently large relative to delisting criteria and HCL rates are sufficiently low to ensure that there is no greater than a 10% chance that the Mexican wolf will fall below the recovery criteria within a 10-year period. The best available science should be used to establish the long-term population target size and acceptable rates of HCL.

DOWNLISTING CRITERIA

Criterion 1 – Population size and trend

Three primary core populations, each with at least 150 wolves, that have been maintained in the wild for 1 generation (4 years). Population size is expected to be increasing during this timeframe. (See Criterion 2.)

Criterion 2 – Amelioration of human-caused losses:

The estimated annual rate of human caused losses averaged over a 4-year period, is less than 15% as measured by a statistically reliable monitoring effort. [Text for recovery justification discussion in plan -This rate is the greatest rate of anthropogenic mortality and removal that a Mexican wolf population could have and still be expected to have an approximately 75% or greater chance of increasing at a rate of at least 5% annually.]

One of the 3 primary core populations proposed was the existing population inhabiting the Mexican Wolf Experimental Population Area (MWEPA), which comprises all suitable wolf habitats in the states of Arizona and New Mexico south of Interstate 40 and north of the US/Mexico international border. A second area of sufficient suitable habitat was described in the Grand Canyon Region of northern Arizona extending into southern Utah. And a third region was identified in the southern Rocky Mountains of northern New Mexico and southern Colorado (see Figure 4 in Carroll et al. 2014).

After expressing their disapproval of the SPS's recovery recommendations, the states of Arizona and Utah leaked those confidential (FOR TEAM ONLY – NOT FOR DISTRIBUTION) 2010 MWRT recommendations to the press, public, and politicians. The USFWS responded by suspending all further meetings of the 2010 MWRT. And Mr. Hefflefinger subsequently resigned from the SPS in December 2012.

Litigation was initiated to force USFWS to complete a final Revised Mexican Wolf Recovery Plan (No. CV-14-02472-TUC-JGZ) and settled (CV-14-02472-TUC-JGZ Document 55, Filed 10/18/16) requiring USFWS to complete a final revised Mexican Wolf Recovery Plan by November 30, 2017.

Anticipating this settlement agreement, which had been negotiated earlier than the court order, USFWS initiated a different recovery process in December 2015 to complete the work of the 2010 MWRT. A series of “information gathering workshops” were held through February 2017.

These workshops were closed-door, invitation-only meetings. It is difficult to know for sure the affiliations of invited attendees because the documentation of attendees lists names only. But it is our understanding that only personnel affiliated with the states of Arizona, New Mexico, Utah, and Colorado, and the USFWS were allowed to participate, as well as representatives from Mexico. All other stakeholders invited to serve on the 2010 MWRT were shut out of the process. An exception was that former SPS scientists from the 2010 MWRT were invited to attend, and four SPS members did attend some but not all of the workshops. To list these four people as participants is disingenuous. Some, and perhaps all, of these workshops included closed sessions to which the former SPS scientists were not invited, and none of these four individuals was invited to preview or otherwise participate in the editing or writing of the *Draft Mexican Wolf Recovery Plan, First Revision* currently under public review. Neither the draft recovery plan nor the supporting *Draft Biological Report for the Mexican Wolf (Canis lupus bailey)* identifies who actually authored the plan.

In the interest of full transparency we request that the list of participants attending the information gathering workshops (Line 41 of Draft Biological Report) be annotated to provide the agency ,organizational, or institutional affiliation of each participant; the number of meetings attended by each participant; which participants were invited to attend “closed” sessions during the workshops; and which participants were excluded from attending those closed sessions.

We further request that those who actually contributed directly to the writing or were given an opportunity to review, edit, suggest edits, or provide comments on the internal working draft of the recovery plan be specifically identified by name and institution.

Such disclosures and transparency would be consistent with Department of Interior policy on scientific integrity as set forth in *Departmental Manual 305DM3*.

Problems with processes like this one (closed-door, invitation-only) are addressed in a recent paper by Lopez-Bao et al. (2017). They state:

Moreover, the initial, constitutive decisions about whom to include in the process may undermine the sometimes-implicit goal that non-participants will find the outcomes legitimate and equitable. Different pitfalls relate to the proper representation of all public interests, such as tyranny of the minority or conflicts of interest. We focus on the effective integration of the broad public interest into decisions on use and preservation of the environment, including biodiversity, and we argue why the broad public interest should be considered a prerequisite to processes that are democratic, legitimate and equitable. When narrower interests become entrenched, conservation conflicts can become chronic as opponents take irreconcilable positions and polarize debate.

The closed-door, invitation-only workshops process was egregiously undemocratic, illegitimate, and inequitable. It is commonly believed that political leaders and representatives of the states of Arizona, New Mexico, Utah, and Colorado largely drove this process. They were given access to the closed-door workshops to the exclusion of other stakeholders. Conspicuously absent were representatives of conservation organizations that have financially, scientifically, and materially supported full science-based recovery of Mexican wolves.

It is well known that the Game Commissions of these states reflect very narrow interests rather than the general public interest in wildlife. We believe there is a high likelihood that Mexican wolves will go extinct under the draft revised recovery plan because the trustees in state and federal agencies do not have the interests of preserving our native imperiled wildlife at heart.

Of the 23 members of the game commissions (some have different names) of the states of Arizona, New Mexico, and Colorado (biographies for members of the Utah Wildlife Board are not available) 57 percent self-identify as consumptive users of wildlife (nearly all identified as hunters); 22 percent identify as ranchers or farmers; 83 percent of all commissioners have personal expertise and/or education in fields unrelated to wildlife management science or conservation; only one individual commissioner has a background and educational training in wildlife management; and only one individual has expertise in conservation biology. Game commissions set policy for their respective game departments. Therefore, the game commissions represented in closed-door workshops reflect very narrow interests rather than the general public interest in wildlife.

Hunters and ranchers in these states represent a very small percentage of the statewide population. Skewed representation of these narrow special interests on game commissions creates a “culture” within state fish and game agencies that generally manages for high populations of ungulate game species; manages to reduce large predator populations; and pays inadequate attention to biodiversity preservation, endangered species conservation, and overall ecosystem health. Such a culture ignores the wishes and rights of a majority of the “public” and future generations, guaranteed by state and federal public trust doctrines and upheld by

Supreme Court decisions since 1892 (*Illinois Central Railroad v. Illinois*, 146 U.S. 387).

Bruskotter et al. (2016) found that experts' judgments were associated with a number of factors outside the "best commercial and scientific data," including their professional affiliations and social norms within the agencies or their home communities – rather than the legal and constitutional norms. They found that conservation judgments were strongly associated with the type of organization that employed the experts, and that those working for state or federal wildlife agencies were 2-3 times more likely to recommend delisting grizzly bears (the specific topic of their survey) than those employed by academic institutions. Bruskotter et al. (2016) expressed concerns that, "as opposed to academic scientists who are somewhat shielded from politics by tenure, scientists in state and federal agencies can face strong, top-down pressure to reach a particular decision." Their premise is clearly demonstrated by the wide disparity between the "best science" expressed by mostly agency scientists in the proposed *Draft Mexican Wolf Recovery Plan, First Revision* and the "best science" expressed by the SPS independent scientists (with a dissenting opinion by the one agency scientist) in the *Draft Mexican Wolf Revised Recovery Plan* (5_07_2012). It is a classic demonstration of the agency cultural bias with regard to a species' risk of endangered as exposed by Bruskotter et al.

In order to balance the discrepancy between the two widely different interpretations of "best science," the USFWS must now give great weight to the views of independent scientists, non-agency scientific societies (such as the Society for Conservation Biology and the American Society of Mammalogists), and independent peer reviewers who were denied representation in the process leading to the development of the *Draft Mexican Wolf Recovery Plan, First Revision* currently under public/peer review.

We also note that the preponderance of peer reviewers contracted by USFWS were highly critical of many aspects of the draft recovery plan and draft biological report which purport to provide the best available science in support of the content and recommendations put forth in the *Draft Mexican Wolf Recovery Plan, First Revision*. This should give USFWS serious cause for concern that perhaps this draft plan misinterprets or fails to use the "best scientific and commercial data" (a requirement of the ESA) relevant to the recovery of Mexican wolves. **The extensive criticisms of the contracted peer reviewers must be honestly and transparently addressed and not merely brushed off as a contrary opinion unworthy of serious consideration.** To do so would make a mockery of the peer review process and would likely be challengeable in court.

We note that the 2010 MWRT still exists (because it has not been officially disbanded) as an entity established by the USFWS for the purpose of developing a revised recovery plan. This gives their extensive work legitimacy as a plan submitted to USFWS for consideration as a roadmap to recovery for the Mexican wolf. To ignore the existence of the SPS's substantial and material contribution and

pretend that it does not exist (the draft plan under review makes no mention of the draft plan developed by the SPS) is an insult to the expertise and hundreds of hours volunteered by these scientists. They conducted their deliberations seriously, apolitically, and with full recognition of the “best science” mandate of the Endangered Species Act (ESA). This is the way the recovery planning process was intended to work. We acknowledge that in forming the 2010 MWRT the USFWS got it right. In abandoning the 2010 MWRT process and ignoring their recommendations in favor of the closed-door/invitation-only workshops dominated by representatives of the states, they got it wrong.

We request that the USFWS replace the recovery criteria presented in the draft revised recovery plan with the recovery criteria developed by the SPS of the 2012 MWRT.

2. Delegation of authority for implementation of the recovery plan to the states is unsupported by past performance and positions taken by the states.

That the USFWS has allowed the states to take control of the decision-making process for Mexican wolf recovery to favor narrow interests and significantly jeopardize the continued existence of Mexican wolves causes grave concerns.

The draft recovery plan states:

In order to achieve the genetic criteria for downlisting and delisting the Mexican wolf in this Plan, the states of Arizona and New Mexico, and the Mexican government, will determine the timing, locations, and circumstances of releases of wolves into the wild within their respective states, and Mexico, from the captive population, with the Service providing collaborative logistical support and facilitation of those recovery actions.

This statement absurdly suggests that this recovery plan can only succeed if the states are delegated control over its implementation. We believe exactly the opposite – that recovery of Mexican wolves can only succeed under federal control and only if the USFWS fully complies with the mandates of the ESA.

Section (2)(c)(2) of the ESA declares a policy of Congress “that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act.” The ESA establishes an affirmative obligation and duty for the federal government to use “all methods and procedures which are necessary” to bring any listed species to the point at which the measures provided in the ESA are no longer necessary. In plainer language, this means that populations of the listed species must be increased and threats abated to the point that the species is no longer in danger of becoming extinct in the foreseeable future (i.e., the species has been recovered).

Section 2(a)(5), which encourages the States and other interested parties, through Federal financial assistance and a system of incentives, to “develop and maintain conservation programs which meet national and international standards” is a key to meeting the Nation’s international commitments and to better safeguarding, for the benefit of all citizens, the Nation’s heritage in fish, wildlife, and plants.

Section (6)(a) requires the Secretary of the Interior to “cooperate to the maximum extent practicable with the States” in carrying out the program authorized by the ESA.

We note that nowhere does the ESA mandate the delegation of authority to the states to implement programs for recovering endangered species. That authority clearly falls to the USFWS and cannot be delegated to the states.


Nie et al. (2017) address this relationship head on. They expose how “the states assert wildlife ownership to challenge the constitutional powers, federal land laws, and supremacy of the United States. While the states do have a responsibility to manage wildlife as a sovereign trust for the benefit of their citizens, most states have not addressed the conservation obligations inherent in trust management; rather, states wish to use the notion of sovereign ownership as a one-way ratchet—a source of unilateral power but not of public responsibility. Furthermore, the states’ trust responsibilities for wildlife are subordinate to the federal government’s statutory and trust obligations... .”

Other scholars have addressed and interpreted state and federal public trust duties in prominent international scientific journals (Bruskotter et al. 2011, Bruskotter et al. 2012, Treves et al. 2017).

Thus, the purpose of sections in the ESA encouraging cooperation with the states is to enlist the states’ support and help to carry out the federal duty to conserve endangered species, not to allow states to dictate recovery actions that are antithetical to ESA mandates.

Ample evidence supports the states opposition to recovery of the Mexican wolf.

Arizona:

1) ARIZONA GAME AND FISH ASKED CONGRESS TO REMOVE ALL FEDERAL PROTECTIONS FOR MEXICAN GRAY WOLVES WHEN THERE WERE ONLY 50 WILD LOBOS IN THE ENTIRE WORLD. The department sent a letter to congressional representatives asking that the lobo be delisted from the Endangered Species Act.¹ 

2) MANAGEMENT BY ARIZONA GAME AND FISH RESULTED IN FEWER WOLVES. From 2003 through 2009, while Arizona Game and Fish led the wolf reintroduction program, the wild population dropped from 55 to 42. In 2009, the

U.S. Fish and Wildlife Service resumed control of the program. From 2010 to 2017, the wolf population rose from 50 to 113.² ☐

3) **ARIZONA GAME AND FISH IS BLOCKING NEW WOLF RELEASES.** On August 7, 2015, the commission voted unanimously to oppose all releases of adult wolves from captivity, even though scientists confirm that the wolves cannot recover without additional releases to boost their genetic health.³ Instead, the state wants to rely on cross-fostering, a still experimental technique that attempts to move captive pups into wild dens. Cross-fostering alone, according to Mexican wolf geneticists, is unlikely to solve the wolves' survival problems.⁴ ☐

4) **ARIZONA GAME AND FISH SUPPORTS INCREASED KILLING AND WOLF REMOVALS.** Game and Fish ignores the 77% of Arizonans who support wolf recovery⁵ when they advocate making it easier to kill and remove these highly endangered wolves, including killing whole families accused of preying on livestock, killing wolves for eating elk or for unspecified "conflicts with human activities."⁶ ☐

5) **ARIZONA GAME AND FISH PUBLICLY INTERFERED WITH RECOVERY PLANNING.** When draft recommendations from the recovery team scientists displeased Arizona Game and Fish, a commissioner publicly leaked the draft plan, even though it was still confidential.⁷ ☐

6) **ARIZONA GAME AND FISH WANTS TO KEEP WOLF NUMBERS TOO LOW.** Recently, Arizona Game and Fish convinced the US Fish and Wildlife Service to cap the number of endangered Mexican gray wolves allowed in the U.S., removing or killing any wolves above the limit. They got a cap of 325⁸ wolves (far below the numbers scientists say are necessary for recovery), but advocated for an even smaller number of 200-300.⁹ ☐

7) **ARIZONA GAME AND FISH WANTS WOLVES KEPT OUT OF THE AREAS THEY NEED TO RECOVER.** They support trapping or killing any lobos that travel toward key habitats north of Interstate 40, ☐ areas that scientists say are crucial for recovery.¹⁰ Game and Fish even thwarted the public process, extracting this promise about the Interstate 40 boundary behind closed doors.¹¹ ☐

8) **ARIZONA GAME AND FISH IS DRIVING RECOVERY PLANNING AWAY FROM SCIENCE AND TOWARD EXTINCTION.** By law, endangered species recovery must be based on the best available ☐ science. But Arizona Game and Fish, via a letter signed by the governor, insists that the majority of Mexican wolf recovery must occur in Mexico¹² despite peer-reviewed science showing that habitats in Mexico alone cannot support enough wolves to prevent extinction,^{10, 13} and despite Arizona's own admission that recovery of the subspecies in Mexico is "improbable."¹¹ ☐

¹ See 7 December 2010 letter from AZ G&F Department Director Larry Voyles, on behalf of the commission: “We ask that you help us . . . to delist the wolf rangewide (including the Mexican wolf)”

² See *Mexican wolf population stalls under AZGFD management*. Population numbers from USFWS, now updated through 2016, see http://www.fws.gov/southwest/es/mexicanwolf/pdf/MW_popcount_web.pdf Removal numbers from USFWS, http://www.fws.gov/southwest/es/mexicanwolf/pdf/MW_removal_causes_web.pdf (graph totals livestock, nuisance and boundary removals). For further discussion, see Environmental Impact Statement for the Proposed Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf (*Canis lupus baileyi*), Final Mexican Wolf Recovery Program, November 2014, pages 1-17 to 1-18.

³ On August 7, 2015, the commission voted to oppose all new releases of adult wolves, and to allow only 6 cross-fostered pups per year. Cross-fostering means moving pups born in captivity into a wild den, a technique which has proven successful only once. Previously, on December 2, 2011, the Commission voted to oppose the release of any new wolves from captivity until the Service completes a new recovery plan, management plan, and 10(j) rule. The Commission amended this policy on January 13, 2012 to allow limited “replacement releases” for animals that are killed. The “gatekeeping” issue is discussed in the USFWS’ release plans for 2015; see **Mexican Wolf Blue Range Reintroduction Project**, Replacement Release, Initial Release and Translocation Proposal for 2015, IFT Final Proposal: February 24, 2015.

⁴ See Arizona Daily Sun, 28 May, 2015. Wolf adoption becomes part of species recovery plan. http://azdailysun.com/news/local/wolf-adoption-becomes-part-of-species-recovery-plan/article_435d3cd6-e9b0-5894-9ef9-314521c3e542.html “Cross-fostering is a tactic, not a plan,” said Richard Fredrickson, a Montana-based biologist who has been on the Mexican Wolf Recovery Team since 2011. “In my opinion it’s very unlikely to really address the problem (of species recovery).”

⁵ See 2008, Research and Polling, Inc., page 12. <http://www.mexicanwolves.org/pdf/Reading17WolfSurveyAZ.pdf> See also 2013, Tulchin Research, page 3.

<http://www.mexicanwolves.org/uploads/polling/Polling%20memo%20AZ%20NM%202013.pdf>

⁶ See cover letter to Benjamin Tuggle, April 15, 2014. Arizona Game and Fish Department is the first signatory. Letter accompanies “Mexican wolf management in Arizona and New Mexico: A Cooperating Agencies Alternative,” 15 April 2014. See Cooperating Agencies Alternative: “. . . removals will occur as necessary to reduce the state-wide population to no more than 150 wolves” (page 8, 5a). These removals would include killing; see page 8 5b iv and v. See page 8, 9. For removals due to depredations, and page 18, bb. (iii) for removal of entire families including pups. For elk removals including removing wolves down to a population of 100 in the state, see page 22, (e). For killing wolves “to avoid conflict with human activities” see page 24, (ii).

⁷ See Complaint of Scientific and Scholarly Misconduct: Intentional Interference in Developing Science-based Recovery Criteria and Suitable Habitat in the Mexican Wolf Recovery Plan by the U.S. Fish and Wildlife Service and State “Partners” to Subvert the Application of Best Scientific Information Regarding Wolf Recovery, June 7, 2012, page 7.

https://www.peer.org/assets/docs/fws/6_7_12_Mex-wolf_Scientific_Integrity_Complaint.pdf

⁸ See Environmental Impact Statement for the Proposed Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf (*Canis lupus baileyi*), Final, Mexican Wolf Recovery Program, November 2014, page 2-36 for statement on rationale for 325 cap. http://www.fws.gov/southwest/es/mexicanwolf/pdf/EIS_for_the_Proposed_Revision_to_the_Regulations_for_the_Nonessential_Experimental_Population_of_the_Mexican_Wolf.pdf

⁹ See Environmental Impact Statement for the Proposed revision to the nonessential experimental population of the Mexican wolf (*Canis lupus baileyi*) Draft, 16 July 2014, pages 2-9 to 2-10.

http://www.fws.gov/southwest/es/mexicanwolf/pdf/Mexican_Wolf_DEIS_July_2014.pdf

¹⁰ Carroll, C., Fredrickson, R.J., Lacey, R.C. Developing Metapopulation Connectivity Criteria from Genetic and Habitat Data to Recover the Endangered Mexican Wolf. *Conservation Biology* 28 (1): 76-86, 2013. For critical nature of habitats north of I-40, see page 78: “. . . results suggest that the southwestern United States has 3 core areas with long-term capacity to support populations of several hundred wolves each. These 3 areas, each of which contains a core area of public lands subject to conservation mandates, are in eastern Arizona and eastern New Mexico (i.e. the Blue Range, the location of the current wild population), northern Arizona and southern Utah (Grand Canyon) and northern New Mexico and southern Colorado (Southern Rockies).” For insufficiency of habitats in Mexico, see page 78: “The majority of the subspecies’ historic range occurred in Mexico . . . However, high human-associated mortality risk and low prey density within potential core areas in Mexico suggests that these areas are unlikely to support populations of over 100 individuals.”

¹¹ See 1 August 2013 letter from AZ G&F Department Director Larry Voyles, to US Fish and Wildlife Director Dan Ashe “. . . Rowan Gould and Gary Frazer both acknowledged . . . that the final rule will direct the USFWS to capture and return any Mexican wolf that disperses outside the MWEPA.” The northern boundary of the MWEPA is Interstate 40.

¹² See 13 November 2015 letter from the Governors of Arizona, New Mexico, Colorado and Utah to Secretary of the Interior Sally Jewel and US Fish and Wildlife Director Dan Ashe “. . . recovery of the Mexican wolf cannot and will not be achieved if the Service does not recognize that the majority of Mexican wolf recovery must occur in Mexico. . . . [Mexico] must be home to the lion’s share of on-the-ground Mexican wolf recovery.”

¹³ Hendricks, S.A., Sesinc Clee, P.R., Harrigan, R.J., Pollinger, J.P., Freedman, A.H., Callas, R., Figura, P.J., Wayne, R.K. 2016. Redefining historical geographic range in species with sparse records: Implications for the Mexican wolf reintroduction program. *Biological Conservation* 194: 48-57. For condition o Mexican habitats see page 53. “Furthermore, most of the historic range in Mexico is currently unsuitable due to human activity and the probability of anthropogenic wolf mortality is high.”

New Mexico:

1) IN JUNE 2011, THE NEW MEXICO GAME COMMISSION VOTED TO END STATE PARTICIPATION IN MEXICAN WOLF RECOVERY. The state's abrupt exit from the program left it short staffed, endangering wolves and making it more difficult for New Mexico landowners to get the timely assistance and support needed to coexist with the wolves.¹ Furthermore, the Mexican wolf is listed as an endangered species under state law, requiring the state to support its recovery. ☐

2) IN MAY 2015, THE NEW MEXICO GAME COMMISSION DENIED A PERMIT FOR TED TURNER'S LADDER RANCH TO HOLD MEXICAN WOLVES.² For 17 years, the ranch had acted as a crucial holding facility for wolves destined for release into the wild – one of only 3 such centers in the U.S. In November 2014, the commission gave itself the power to deny the permit, which it soon exercised. The U.S. Fish and Wildlife Service criticized the move, saying it “may hamstring species recovery.”³ ☐

3) ALSO IN 2015, THE STATE BEGAN REQUIRING THE USFWS TO OBTAIN A STATE PERMIT TO RELEASE WOLVES IN THE STATE – AND THEN BLOCKED CRITICALLY NEEDED WOLF RELEASES. In January 2015, the US Fish and Wildlife Service completed a rule change which for the first time would allow the release of wolves directly from captivity into New Mexico. Previously captive wolves could only be released in Arizona, and could then disperse into New Mexico, or, wolves that had been in the wild before could be released in New Mexico. Scientists had warned for more than a decade that direct releases from captivity into New Mexico were necessary for the survival and recovery of the wolves, and the situation was now dire. When the Service attempted to release wolves under the new rule, the state, for the first time, asked the Service to apply for a state release permit, which it then denied. In May of 2016, the Service, having lost a year of critically needed releases trying to navigate New Mexico's new requirements, asserted its authority under the Endangered Species Act⁴ and released two wolf pups. ☐

4) IN MAY 2016, THE NEW MEXICO DEPARTMENT OF GAME AND FISH SUED THE USFWS TO COMPEL REMOVAL OF THE RELEASED PUPS AND STOP ALL FUTURE WOLF RELEASES. New Mexico stated that their intent was to challenge the new rule allowing releases of wolves from captivity into the state.⁵ While New Mexico was originally granted a preliminary injunction against releases in District Court, that injunction was overturned in the 10th circuit.⁶ The case returns now to the District Court. ☐

5) NEW MEXICO GAME AND FISH IS DRIVING RECOVERY PLANNING AWAY FROM SCIENCE AND TOWARD EXTINCTION. By law, endangered species recovery must be based on the best available science. But New Mexico Game and Fish, via a letter signed by the governor, insists that the majority of Mexican wolf recovery must occur in Mexico⁷ despite peer-reviewed science showing that

habitats in Mexico alone cannot support enough wolves to prevent extinction.^{8,9}
?

6) NEW MEXICO'S ANTI-WOLF ACTIONS IGNORE THE MAJORITY OF NEW MEXICANS WHO SUPPORT LOBO RECOVERY. 69% of New Mexican voters support the reintroduction of wolves in the state¹⁰ and 80% believe the U.S. Fish and Wildlife Service should make every effort to help wolves recover and prevent extinction.¹¹ ?

¹ Minutes of the New Mexico State Game Commission meeting, June 9, 2011. See Item 12.

<http://www.wildlife.state.nm.us/legacy/commission/minutes/documents/2011/6-9-11OFFICIAL.pdf>

² Minutes of the New Mexico State Game Commission meeting, May 7, 2015. Begins on page 14.

http://www.wildlife.state.nm.us/download/commission/minutes/2015/MIN-Game-Commission-05_07_2015-FINAL.pdf

³ Albuquerque Journal, May 8, 2015.

<https://www.abqjournal.com/582000/turner-ranch-denied-wolf-permit.html>

⁴ Opening brief for the U.S. Department of the Interior *et al.*, filed in the Tenth Circuit Court of Appeals on appeal of the U.S. District Court ruling granting New Mexico a preliminary injunction against wolf releases in the state, Appeal Nos. 16-2189 & 16-2202, September 9, 2016 see pages 7-15.

⁵ Reply brief for New Mexico Department of Game and Fish, filed in U.S. District Court in support of its motion for a preliminary injunction, Case No. 1:16-cv-00462-WJ-KBM, May 25, 2016, see page 6.

⁶ Opinion from the Tenth Circuit Court of Appeals, *New Mexico Department of Game and Fish v. U.S. Department of the Interior*, Appeal Nos. 16-2189 & 16-2202, April 25, 2017.

⁷ See 13 November 2015 letter from the Governors of Arizona, New Mexico, Colorado and Utah to Secretary of the Interior Sally Jewel and US Fish and Wildlife Director Dan Ashe "... recovery of the Mexican wolf cannot and will not be achieved if the Service does not recognize that the majority of Mexican wolf recovery must occur in Mexico. ... [Mexico] must be home to the lion's share of on-the-ground Mexican wolf recovery."

⁸ Carroll, C., Fredrickson, R.J., Lacey, R.C. Developing Metapopulation Connectivity Criteria from Genetic and Habitat Data to Recover the Endangered Mexican Wolf. *Conservation Biology* 28 (1): 76-86, 2013. For critical nature of habitats north of I-40, see page 78: "... results suggest that the southwestern United States has 3 core areas with long-term capacity to support populations of several hundred wolves each. These 3 areas, each of which contains a core area of public lands subject to conservation mandates, are in eastern Arizona and eastern New Mexico (i.e. the Blue Range, the location of the current wild population), northern Arizona and southern Utah (Grand Canyon) and northern New Mexico and southern Colorado (Southern Rockies)." For insufficiency of habitats in Mexico, see page 78: "The majority of the subspecies' historic range occurred in Mexico ... However, high human-associated mortality risk and low prey density within potential core areas in Mexico suggests that these areas are unlikely to support populations of over 100 individuals."

⁹ Hendricks, S.A., Sesinc Cleo, P.R., Harrigan, R.J., Pollinger, J.P., Freedman, A.H., Callas, R., Figura, P.J., Wayne, R.K. 2016. Redefining historical geographic range in species with sparse records: Implications for the Mexican wolf reintroduction program. *Biological Conservation* 194: 48-57. For condition of Mexican habitats see page 53. "Furthermore, most of the historic range in Mexico is currently unsuitable due to human activity and the probability of anthropogenic wolf mortality is high."

¹⁰ See 2008, Research and Polling, Inc., page 12.

<http://mexicanwolves.org/pdf/Reading18WolfSurveyNM.pdf>

¹¹ See 2013, Tulchin Research, page 3

<http://www.mexicanwolves.org/uploads/polling/Polling%20memo%20AZ%20NM%202013.pdf>

Similar evidence exists for the positions of the states of Utah and Colorado in opposition to Mexican wolf recovery and is available upon request.

Considering the above analysis as "data" on the "culture" of the Arizona Game and Fish Department and the New Mexico Department of Game and Fish, the decision to put them in charge of recovery plan implementation does not reflect an accurate interpretation of the best available data. Given the states' documented antipathy to Mexican wolves and their full science-based recovery, the decision to delegate authority to the states for implementation of the recovery plan must be reversed.

The USFWS must retain full control of all actions necessary to implement the final recovery plan.

3. The coincidental convergence of the 2015 ESA (10)(j) rule and the output of the Vortex PVA model.

We provide evidence above that the States of Arizona and New Mexico proposed a cap of 200-300 wolves in the MWEPA as an alternative presented to the USFWS for inclusion in the Environmental Impact Statement for the 2015 revision of the MWEPA rule. The following is excerpted from page 2-9 of the *Draft Environmental Impact Statement For The Proposed Revision To The Nonessential Experimental Population Of The Mexican Wolf (Canis Lupus Baileyi)* (July 2014):

An alternative that included this proposed revision would establish a numerical objective for the size of the experimental population of Mexican wolves of between 200 and 300 wolves, split evenly between the states of Arizona and New Mexico.

On page 2-10 of the draft EIS, the USFWS issued the following rejection of this proposal:

Establishment of a numerical objective for the size of the experimental population of Mexican wolves may be an important part of recovery planning in which the experimental population would function as a subpopulation to a viable and self-sustaining metapopulation of Mexican wolves. However, full recovery is beyond the scope of this EIS and setting this population objective now would be premature and would therefore not contribute to the achievement of our objective to further the conservation of the Mexican wolf by improving the effectiveness of the reintroduction project in managing the experimental population. For these reasons we rejected this proposed revision because, using our established selection criteria, it does not substantially meet the purpose of, and need for, the Proposed Action.

Clearly, in this statement the USFWS saw the wisdom of allowing unrestricted population growth in the MWEPA population so as not to foreclose future recovery decisions and needs for Mexican wolves in the US.

But something inexplicably happened to change the USFWS's position between the draft and final documents establishing the new regulation for the Mexican wolf population inhabiting the MWEPA.

In the final *Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf*, the USFWS established "a population objective of 300 to 325 Mexican wolves within the MWEPA throughout both Arizona and New Mexico with a minimum of 1 to 2 effective migrants per generation entering the population, depending on its size, over the long term." This recommendation was made in the context of a discussion of recovery recommendations for Mexican wolves that

supported the establishment of three interconnected populations in the US (Federal Register 2015:2517). The USFWS adds that:

*We will continue to refine this information through a **revised recovery plan**. It will be important to ensure that a specific number of effective migrants are incorporated into the population, in this case from captivity, until such time as other wild populations are established within the context of a metapopulation as defined in a Service-approved recovery plan (Carroll et al. 2014, entire). **Prior to the establishment of other wild Mexican wolf populations outside of the MWEPA and documentation of effective migrants between wild populations**, we will need to use the captive population as a source of migrants for the experimental population. (emphasis added).*

Clearly, the USFWS continued to anticipate the need for additional populations outside the MWEPA to achieve full recovery of Mexican wolves and cited Carroll et al. (2014: see Figure 4) as the authority. This suggests that the USFWS was anticipating that additional population(s) would be established within the United States.

The 2015 revised rule (50CFR 17.84(k)(9)(iii)) further states that, “Based on end-of-year counts, we will manage for a population objective of 300 to 325 Mexican wolves in the MWEPA in Arizona and New Mexico. **So as not to exceed this population objective**, we will exercise all management options with preference for translocation to other Mexican wolf populations to further the conservation of the subspecies. **The Service may change this provision as necessary to accommodate a new recovery plan.**” (emphasis added)

While the USFWS acquiesced to the pressure from the states of Arizona and New Mexico to set a cap of 325 wolves on the MWEPA population, they left an opening in the final regulation to change that provision if the revised recovery plan included different criteria for recovery.

The current recovery planning process used the Vortex PVA modeling tool to predict the number of wolves needed to ensure the long-term survival of Mexican wolves with a 10% risk of extinction over the next 100 years—a level of risk the we believe it too high.

The amount of scientific data gathered for input to the model is impressive and seemingly sophisticated. For example the entire genetic pedigree of the captive population was included in the model to track genetic composition and gene diversity retention in the wild and captive populations. The model works by front-loading the scientific data, making some informed assumptions about events that could randomly impact population growth, then running 1000 iterations of the model over a time span of 100 years. PVA models are predictive, that is, the model output is not pre-determined or set in advance.

A casual reader of the documents under review could be easily convinced that the Vortex PVA modeling exercise is based on the best available scientific data. **But this is not the case.**

One of the inputs into the model is called the “management target.” It is defined on page 9 of Appendix A to the *Draft Biological Report for the Mexican Wolf Version for Peer Review* dated 5/1/2017 as follows:

*The wolf population abundance deemed both biologically viable (according to identified recovery criteria) and **socially acceptable** in light of the expected ongoing issues around livestock depredation and other forms of wolf-human conflict. (emphasis added)*

Within the inner workings of the model “**if a given population exceeds its management target abundance in a given year, both adults and pups are ‘harvested’ from the population in equal numbers until the target abundance is reached.**” (emphasis added)

This bears repeating. “**If a given population exceeds its management target abundance in a given year, both adults and pups are ‘harvested’ from the population in equal numbers until the target abundance is reached.**”

Incredibly, this model is **capped** at whatever management target population size is chosen for the MWEPA population. All the esoteric “science-based” inputs rolled into the model are rendered pointless because of the complete overriding effect of the management target on the outcome of the model. Because the model “harvests” all wolves above the population size chosen as the management target, the output of the model for the MWEPA population is guaranteed to be the same as the arbitrarily chosen management target. **This is egregiously and unacceptably unscientific.**

Not one word of scientific evidence or justification is provided in the draft plan or biological report for the numbers inserted into the model as “management targets.”

This clearly violates the “best science” standard set forth in the ESA.

We request a full analysis of the scientific evidence and justification for the numbers chosen as management targets for input to the Vortex PVA model.

The numbers arbitrarily chosen for testing in the model as the management target for the MWEPA were 300, 340, and 379. The source and justification for these numbers is not disclosed. Inexplicably, the model settled on 320 as the minimum number of Mexican wolves needed in the MWEPA, and in the entire United States, to meet recovery objectives for the critically endangered and genetically impoverished Mexican gray wolves.

The model incorporates an estimated ecological carrying capacity for the MWEPA of 1000 wolves based on the habitat analyses presented in the biological report. Presumably, absent the input of management targets, the MWEPA population would tend to increase until it bumped up against the ecological carrying capacity. This creates the necessity for the model to “kill” all wolves that survive in excess of the management targets.

The harmonic convergence of the cap of 325 Mexican wolves imposed by the 2015 revised rule and the management target of 320 wolves derived through the Vortex PVA modeling exercise seems highly unlikely to have happened by chance. In fact, both numbers were arbitrarily and unscientifically decided by the states and the USFWS as the number of wolves that would be allowed to occupy the MWEPA. The convergence is convenient for the USFWS, as it will not force a revision of the 2015 rule to accommodate a final recovery plan that calls for more than 325 wolves in the US.

This created a problem for the recovery planners because the Vortex PVA model needed more than 320 Mexican wolves in the wild to achieve full recovery and avoid a high risk of extinction.

The solution was to insert additional management targets for wolves in one or two populations of wolves that would be established in the country of Mexico. That management target was determined to be 170 wolves.

4. Data for assessing the suitability of habitats in Mexico and used in the Vortex PVA model are fraught with uncertainty.

The following excerpts from *Wolf Habitat Suitability Analysis in Historical Range in the Southwestern US and Mexico* (Martinez-Meyer et al. 2017) are presented to underscore the high level of uncertainty in the analyses this report presents.

“Data available for the ungulate biomass index was not robust enough to generate reliable rangewide estimates.” (Page iii)

“Our results suggest there is still sufficient suitable habitat for the Mexican wolf in the US and Mexico, but specific sites for reintroductions need to consider reliable field data of prey density, cattle density, land tenure, natural protected areas, safety to the field team, and acceptability of the wolves by local people.” (Page iii)

“In order to support the recovery of the Mexican wolf it is important to base the geography of recovery on the best available science.” (Page 5)

“Mexico information is quite reliable for some factors (e.g., land cover or population density), but is low-quality or lacking for many regions with the distribution of the Mexican wolf for other factors (e.g., prey density). An additional problem has been the difference in the classification scheme of the vegetation types in the two countries that makes it difficult to homogenize.” (Page 19)

“All variables were clipped to the potential distribution map of the Mexican wolf.” (Page 19). Excludes data north of I-40.

WTD density estimates in Mexico. “UMA data were gathered and organized by Jorge Servin, but the original source came from the UMA’s field technicians that estimated deer density under different sampling techniques (e.g., direct, tracks and fecal pellet counts), but reliability has not been thoroughly evaluated, thus there is some uncertainty in these estimates.” (Page 31)

Mule Deer. “We discarded the UMA data from the UBI modeling because values reported in the Sonora and Chihuahua UMA’s were up to 10 times greater than the average values for Arizona and New Mexico.” (Page 32)

“In general, for elk, the variance explained with the RF regression models was good, but low for the mule deer and white-tailed deer (Table 8). Low R^2 , particularly for deer data, is a consequence of the large dispersion of density data values, where variability exists within and amongst identical climate and topographic areas. Despite this, a relationship with predictor variables exists, which suggests that the model conservatively estimates the central tendency for the broader landscape.” (Page 36) This does not instill high confidence in the estimates. Nevertheless, UBI maps were generated.

Habitat suitability scenarios. “However, the highest-quality areas were found in large patches only in the Arizona-New Mexico and in much lesser extent in the two Sierras Madres” (Page 52)

“Our estimates of prey density and UBI come with significant uncertainty, mainly for the Mexican portion of the distribution of the wolf.” (Page 65)

“The UBI values for any given pixel may not accurately represent the actual biomass at that location.” (Page 65)

“We observed large variations in the wolf numbers depending on the method.” (Page 65)

“Another general result is that the largest estimated wolf population sizes were from the Arizona-New Mexico region in the MWEPA area.” (Page 66)

“The question that arises is, which of all these estimations is reliable?” (Page 68)

“None were intended to predict the number of wolves one could expect when recovering a population from extirpation (especially not in the Southwestern US).” (Page 68)

“In the Mexican side, the numbers are even more uncertain.” (Page 68)

In Mexico: “Most of high-suitable areas for wolves are under private lands.” (Page 69)

“The MWEPA is the area overall with the highest-quality habitat due to the high availability of ungulate, particularly elk and therefore, with the high estimation of Mexican wolf carrying capacity under any scenario.” (Page 69)

This long list of admitted uncertainties in the habitat analysis data, especially with regard to habitats in Mexico, raises serious concerns.

One of the most important attributes contributing to habitat quality for wolves is the density of wild ungulates. The ungulate biomass index (UBI) data for Mexico are so

poor and uncertain that correlations between prey density and expected wolf population density could not be made.

While two large areas in the Sierra Madre Occidental (northern and southern SMO) were determined to have high suitability as potential wolf habitat, their availability for wolf occupation is totally ignored by the authors of the report. The report states that “[m]ost of high-suitable areas for wolves [in Mexico] are under private lands.” The word “most” implies that the actual value lies somewhere between 51-99%. No quantitative data on land tenure patterns are presented. No assessment of the attitudes of private landowners in areas identified as suitable habitat was conducted. And no survey of landowners’ willingness to allow wolf recolonization on their property was conducted. Thus, it is impossible to predict, with any acceptable degree of certainty, how many wolves can be supported in Mexico; and it is egregiously unscientific for the USFWS to “count” highly speculative goals and potential carrying capacity estimates for restoration of wolf populations in Mexico toward the overall recovery goals for the Mexican gray wolf.

Compounding this uncertainty is the USFWS’s complete lack of authority over wolf recovery actions in Mexico.

These two areas of uncertainty should raise a huge red flag regarding the portion of suitable habitats actually suitable and available for wolf recovery in Mexico.

One consistent conclusion from the habitat analysis is that habitats within the MWEPA (in the United States) are significantly superior to habitats in Mexico. This argues for unrestrained opportunities for Mexican wolf recovery in the US.

We recommend that the population cap of 320-325 wolves in the MWEPA be removed; that wolves in the US be allowed unlimited dispersal to habitat they (the wolves, not the humans) determine to be suitable by eliminating the I-40 barrier to dispersal); that the two areas of suitable habitat identified by the 2010 MWRT SPS team lying north of I-40 be identified as future reintroduction/recovery sites to be used to achieve recovery benchmarks based on the best science.

The above recommendations are justified by the admitted and unadmitted uncertainty of the data presented in support of the draft recovery plan recommendations. And, furthermore, the recommendations are consistent with the **Precautionary Principle**. Incredibly, the draft recovery plan and biological report are completely silent on the need to incorporate precautionary principles into the recovery criteria.

5. Precautionary benchmarks are necessary to ensure recovery success.

The proposed reviews at 5 and 10 years are woefully inadequate to assure steady progress toward recovery of Mexican wolves. Assessments of recovery progress must be made on an annual basis and must be tied to specific benchmarks that invoke specific and immediate management responses if benchmarks are not met.

Benchmarks/management responses need to be developed by the USFWS to address at a minimum the following performance parameters:

- ❖ Wolf population growth trajectories in both the US and Mexico populations.
- ❖ Genetic rescue targets over time for both the US and Mexico populations.
- ❖ Wolf reintroduction/translocation schedules and targets in both the US and Mexico populations.
- ❖ Performance of the states, if management authority is delegated by the USFWS.

We recognize that the USFWS has no authority to impose management performance standards in Mexico. But if recovery performance expectations are not being met in Mexico, the USFWS must take compensatory management actions in the US to fulfill their “duty to conserve” mandate under the ESA.

6. Comments on historic range.

The concept of historic range delineations for subspecies of wide-ranging carnivores, especially gray wolves in North America, does not lend itself to the drawing of bright lines on maps. Gray wolves in western North America were contiguously distributed, historically, from Arctic regions to central Mexico. Their pattern of long-range dispersal created broad zones of genetic intergradation between identified subspecies (Leonard et al. 2005).

The paper by Hefflefinger et al. (2017) presents an archaic (morphological) perspective on delineating the historic range of *Canis lupus baileyi*. It is tempting to presume an underlying political agenda for preventing the colonization of Mexican wolves into suitable habitats (currently devoid of wolves) existing north of I-40. Indeed, participants (including Hefflefinger) in the closed-door, states-only workshops chose I-40 as the northern limit for Mexican wolf recovery analyses based on “geopolitical” considerations (see page 4, Draft Notes Mexican Wolf Recovery Planning Workshop, April 11-15, 2016, Galleria Plaza Reforma, Mexico City, Mexico).

Some of the USFWS’s peer reviewers are highly critical of Hefflefinger et al. (2017).

Hefflefinger et al. (2017) is far from settled science on the subject of historic range of the Mexican gray wolf. In their rebuttal to Hefflefinger et al., Hendricks et al.

(2017 in press) offer the following criticisms of Heffelfinger et al's. (2017) hypotheses and conclusions.

"[E]arly historical observations are weak data for range inference and opinions of "experts" (as defined by Heffelfinger et al.) were developed under a typological framework in large part prior to acceptance of the modern evolutionary synthesis and did not incorporate evolutionary thinking.

Under a modern view of admixture in current wolves, larger wolves observed by past naturalists may have been admixed or, despite size differences, are genetically and evolutionarily Mexican wolves. Large intergradation zones likely existed between Mexican wolves and other adjoining populations as suggested by the historical genetic data (Leonard et al. 2005; Hailer and Leonard 2008). Hence, a simple typological model as advocated by Heffelfinger et al. is not appropriate for informing either conservation or reintroduction decisions.

Several conclusions by Heffelfinger et al. seem to misrepresent habitat suitability models. ... These models do, however, identify habitat, outside the traditionally defined historical range of the Mexican wolf, that are currently suitable for this species.

Natural admixture zones should be part of reintroduction plans and admixed individuals providing ecosystem functionality should receive protection (Arnold 2016; Wayne and Shaffer 2016; vonHoldt et al. 2017).

Given the difficulty of establishing Mexican wolves in the US and Mexico, which contrasts with the considerable success of Yellowstone-Idaho reintroduction (Wayne and Hedrick 2011), expanded historical range and suitable habitat is desperately needed, and as discussed above, is supported by ecological and genetic evidence. Further, climate change is likely to increase the proportion of suitable range northwards. Contemporary species conservation needs to move beyond strict adherence to maintaining or restoring populations within their putative historical ranges.

A better guideline for determining where Mexican wolves should be restored is where suitable unoccupied habitat exists. The draft recovery plan prepared by the 2010 MWRT SPS provides extensive science-based justification for two such areas north of I-40.

We request that the revised recovery plan include measures to restore wolves to suitable habitats north of I-40 as identified in the draft recovery plan submitted by the SPS of the 2010 MWRT.

7. Mortality rates used in the Vortex PVA model are unrealistically low.

The plan justifies use of lower mortality rates by assuming that future human-caused mortality rates will be lower than those observed in the past for Mexican wolves. However, unlike in the SPS draft plan, no recovery criteria have been proposed that would ensure that mortality rates are as low or lower than the rate assumed in PVA. Additionally, mortality rates in the PVA are affected by assumptions regarding the extent and number of years in which supplemental feeding of the wild population occurs. Due to expected future resource limitations on agencies conducting supplemental feeding, the PVA's assumptions regarding such feeding are likely unrealistic. Therefore, the PVA paints an optimistic picture of the success of future interventions to reduce human-caused mortality. No scientific basis for such optimism is presented.

Estimates of human caused mortality fail to acknowledge recent research which demonstrates that mortality of wolves from poaching is systematically underestimated by government agency biologists and policy makers (Treves et al. 2017). They found that the risk of mortality of Mexican wolves due to poaching was 0.07-0.21 higher than estimated by agency managers. Indeed, for every wolf population examined by Treves et al. (2017), which included Mexican wolves, they found poaching was the greatest threat to wolf survival.

The Vortex PVA model fails to acknowledge or incorporate these important new findings. Given the high sensitivity of the model to different mortality rates, this could result in significant underestimates of population sizes needed for recovery.

8. The Vortex PVA model downplays effects of inbreeding depression.

Carroll et al. (2014) found that the strength of inbreeding depression was the fourth most important parameter affecting subpopulation extinction among simulated populations of Mexican wolves.

The current PVA incorporates inbreeding effects on the probability of producing a litter, but not as an influence on litter size. This weaker inbreeding effect is based on an unpublished, non-peer reviewed analysis by Clement and Cline (2016).

Clement and Cline (2016) assume no litter sizes of zero. And litter size is measured after emergence from the den. This eliminates any inclusion of aborted litters or litters with all pups dying in the den, thus eliminating a potentially important indicator of inbreeding depression from their analysis.

Furthermore, the survival of newborn pups is likely increased through the extensive practice of supplemental feeding of reproductively successful packs. If supplemental feeding were eliminated or reduced, as proposed in the draft recovery plan, it is likely that the negative association of inbreeding and litter size would be more easily observed.

Peer reviewer 2 offers substantive criticisms of the Clement and Cline analysis of inbreeding effects in the MWEPA population of Mexican wolves. Peer reviewer 2 concludes that the “results of Clement and Cline (2016) are quite surprising and unsupportable.”

9. Under-estimating inputs to the Vortex PVA model creates significant risks for the future survival of Mexican wolves.

The accuracy of various inputs to the Vortex PVA model have been questioned by us and other peer reviewers. To many reviewers not directly involved in developing model inputs, it appears that the tendency of those making model input decisions was to choose values on the low side of a range of possible, real-world values for those parameters. We find this to be especially true for expected mortality rates and effects of inbreeding.

The result is proposed numerical criteria for Mexican wolf recovery that we believe poses unacceptable risks that could just as likely lead to extinction rather than recovery.

10. Conclusions.

Following careful and detailed review to the *Draft Mexican Wolf Recovery Plan, First Revision*, the *Draft Biological Report for the Mexican Wolf (Canis lupus bailey)*, and relevant scientific literature, we come to the following conclusions:

- The process for developing the draft revised recovery plan, orchestrated by the federal agency with public trustee responsibility over endangered wildlife in the United States, was undemocratic, illegitimate, inequitable and unethical.
- Delegation of authority for implementation of the recovery plan to the states is unsupported by past performance and positions taken by the states and not required by the ESA.
- Capping the output of the Vortex PVA model by inserting arbitrary “management targets” that are unsupported by any relevant science disqualifies the entire Vortex PVA process and outputs from representing any semblance of the “best available scientific and commercial data” required by the ESA, regardless of the scientific underpinnings of other input parameters.
- Results presented in the *Wolf Habitat Suitability Analysis in Historical Range in the Southwestern US and Mexico* (Martinez-Meyer et al. 2017) for habitats in Mexico are fraught with uncertainty and fatally flawed.

- The process for developing the draft recovery plan completely and unscientifically abandons the Precautionary Principle. Precautionary benchmarks are necessary to ensure recovery success.
- Suitable habitats necessary for recovery of Mexican wolves lying north of I-40 in the US have been unscientifically and politically excluded from consideration and must be reconsidered.
- Inputs to Vortex PVA model have the effect of lowering minimum viable population estimates increasing the risk that recovery recommendations will fail, thus jeopardizing the continued existence of *Canis lupus baileyi* in the wild.
- Reliance on a foreign nation to “make up the difference” to ensure recovery of Mexican wolves as required by US law is an unacceptable policy almost guaranteed to be challenged in court.
- We believe there is a high likelihood that Mexican wolves will go extinct under the draft revised recovery plan.

We greatly appreciate and support efforts being undertaken in Mexico to recover their namesake subspecies of the gray wolf. But, we believe the USFWS in service to the US Government, all citizens of the United States, and the wildlife assets it is entrusted to steward and conserve has an obligation to maximize its efforts to recover Mexican wolves in the United States in support of the binational effort. The goal should be to ensure that Mexican wolves are restored to suitable habitats at ecologically effective densities throughout the Southwestern US and Northern Mexico.

Thank you for this opportunity to comment.

Sincerely,



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